

## Rate Structure and Supporting Information Analysis

### Marine Terminal Cost:

#### Cost Per MCF:

• Capital Cost	\$0.012 /MCF
• Fuel Cost	\$0.140 /MCF
• Property Tax at 2%	\$0.036 /MCF
• Operating Cost	\$0.250 /MCF
• Equipment Repair & Replacement	\$0.100 /MCF
Total	<u>\$0.538 /MCF</u>

### NGL Plant Rate Cost:

#### Cost Per MCF:

• Capital Cost	\$0.011 /MCF
• Fuel Cost	\$0.120 /MCF
• Property Tax 2%	\$0.033 /MCF
• Operating Cost	\$0.200 /MCF
• Equipment Repair & Replacement	\$0.100 /MCF
Total	<u>\$0.464 /MCF</u>

### LNG Plant Cost:

• Capital Cost	\$0.046 /MCF
• Fuel Cost	\$0.660 /MCF
• Property Tax 2%	\$0.142 /MCF
• Operating Cost	\$0.609 /MCF
• Equipment Repair & Replacement	\$0.320 /MCF
Total	<u>\$1.777 /MCF</u>

### Pipeline Cost:

• Capital Cost	\$0.294 /MCF
• Fuel Cost	\$0.190 /MCF
• Property Tax 2%	\$0.243 /MCF
• Operating Cost	\$0.200 /MCF
• Equipment Repair & Replacement	\$0.400 /MCF
Total	<u>\$1.327 /MCF</u>

### Summary:

• Marine Terminal Cost	\$0.538 /MCF	
• NGL Plant Rate Cost:	\$0.464 /MCF	
• LNG Plant Cost:	\$1.777 /MCF	
• Pipeline Cost	<u>\$1.327 /MCF</u>	
Total	\$4.106 x 0.15 (Profit)	\$4.722

2.5.1 - Cost Estimate for Development Phase  
Pipeline and Compression Station Cost

**2.5.1 - Cost Estimate for Development Phase**

**2.5.1.1 Pipeline and Compression Station Cost (Development Phase).**

<b>• Front End Engineering Design, includig (but not limited to)</b>	
<b>o Route and Site Selection</b>	
Cost:	10,000,000.00
<b>o Basis of Design (e.g., line sizing and throughput determination, compression station locations and horsepower)</b>	
Cost:	308,500,000.00
<b>o Technology Assessments</b>	
Cost:	5,000,000.00
<b>o Environmental Impact Studies and Assessments</b>	
The \$40 million cost for EIS is already included in the Basis of Design above.	
Cost:	0.00
<b>• Right-of-Way Determination and Neogitations</b>	
Cost:	2,000,000.00
<b>• Regulatory and Permitting Activities including (but not limited to).</b>	
o Preparation of FERC, NEB, NPA, RCA applications	
o Costs Associated with FERC, NEB, NPA, and RECA approvals	
o Preparation of applications for other permits.	
The \$50 million cost for this work has already been included in Basis of Design above.	
Cost:	0.00
<b>• Project Management for all the work in the Development Phase</b>	
Cost:	20,000,000.00
<b>• Other cost categories (if needed)</b>	
Office Space Rental	400,000.00
Travel, Trasnportation	2,000,000.00
Computer Modeling	5,000,000.00
Public Relations	10,000,000.00
Legal	5,000,000.00
Insurance	1,000,000.00
Taxes	500,000.00
Office Support	500,000.00
	24,400,000.00

2.5.1 - Cost Estimate for Development Phase  
Pipeline and Compression Station Cost

**Application should document the data and methods used to estimate:**

- **Work Hours**

Engineer Hours	700,000	x	\$150.00	105,000,000.00
Engineering Manager	80,000	x	\$250.00	20,000,000.00
Technician Hours	1,000,000	x	\$80.00	80,000,000.00
Clerical Hours	125,000	x	\$60.00	7,500,000.00
Lawyer Hours	20,000.00	x	\$250.00	5,000,000.00
Misc. Staff Hours	10,000	x	\$100.00	1,000,000.00
EIS Engineer Hours	600,000	x	\$150.00	90,000,000.00
				308,500,000.00

- **Hourly Costs**

Environmental Engineer	\$150.00
Engineers	\$150.00
Engineering Manager	\$250.00
Technical	\$80.00
Clerical	\$60.00
Lawyer	\$250.00
Misc. Staff	\$100.00

- **Resource Requirements**

This plan total cost of \$345.5 million will be funded by Sinopec through a loan agreement. It will be repaid to Sinopec once the construction loan is in place.

Total Project Cost - Development Phase	\$345,500,000.00
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## 2.5.1 Cost Estimate for Development Phase LNG Plant

### **2.5.1 - Cost Estimate for Development Phase**

#### **2.5.1.2 LNG Plant Cost (Development Phase)**

• Front End Engineering Design, including (but not limited to)	
o Route and Site Selection	
Cost:	2,000,000.00
o Basis of Design (e.g., line sizing and throughput determination, compression station locations and horsepower)	
Cost:	121,500,000.00
o Technology Assessments	
Cost:	2,000,000.00
o Environmental Impact Studies and Assessments	
The \$15 million cost for this EIS is included in the Basis of Design above.	
Cost:	0.00
o Right-of-Way Determination and Negotiations	
Cost:	5,000,000.00
• Regulatory and Permitting Activities including (but not limited to).	
o Preparation of FERC, NEB, NPA, RCA applications	
o Costs Associated with FERC, NEB, NPA, and RECA approvals	
o Preparation of applications for other permits.	
Cost:	65,000,000.00
• Project Management for all the work in the Development Phase	
Cost:	20,000,000.00
• Other cost categories (if needed)	
Office space rental (paid by Pipeline Cost)	0.00
Travel, transportation	2,000,000.00
Computer simulation and modeling	5,000,000.00
Public Relations	2,000,000.00
Legal (For EIS Application)	5,000,000.00
Insurance	1,000,000.00
Tax	0.00
Office Support	200,000.00
	15,200,000.00

## 2.5.1 Cost Estimate for Development Phase LNG Plant

Application should document the data and methods used to estimate:

- Work Hours

Engineer	500,000	x	\$150.00	75,000,000.00
Engineering Manager	40,000	x	\$250.00	10,000,000.00
Technician	100,000	x	\$80.00	8,000,000.00
Clerical	125,000	x	\$60.00	7,500,000.00
Lawyer	20,000.00	x	\$250.00	5,000,000.00
Misc. Staff	10,000	x	\$100.00	1,000,000.00
EIS Engineer	100,000	x	\$150.00	15,000,000.00
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				121,500,000.00

- Hourly Costs

Engineer	\$150.00
EIS Engineer	\$150.00
Engineering Manager	\$250.00
Technical	\$80.00
Clerical	\$60.00
Lawyer	\$250.00
Misc. Staff	\$100.00

- Resource Requirements

This development phase cost of \$230.7 million will be funded by Sinopec through a loan agreement. It will be replaced once the construction loan is in place.

Total Cost: \$230,700,000.00

2.5.1 Cost Estimate for Development Phase  
NGL Plant

**2.5.1 - Cost Estimate for Development Phase**

**2.5.2.3 - NGL Plant Cost (Development Phase)**

• <b>Front End Engineering Design, including (but not limited to)</b>			
o <b>Route and Site Selection</b>			
Cost:			2,000,000.00
o <b>Basis of Design (e.g., line sizing and throughput determination, compression station locations and horsepower)</b>			
Cost:			46,250,000.00
o <b>Technology Assessments</b>			
Cost:			1,000,000.00
o <b>Environmental Impact Studies and Assessments</b>			
This \$1.2 million cost is included in the Basis of Design above.			
Cost:			0.00
o <b>Right-of-Way Determination and Negotiations</b>			
Cost:			2,000,000.00
• <b>Regulatory and Permitting Activities including (but not limited to).</b>			
o <b>Preparation of FERC, NEB, NPA, RCA applications</b>			
o <b>Costs Associated with FERC, NEB, NPA, and RECA approvals</b>			
o <b>Preparation of applications for other permits.</b>			
Cost:			15,000,000.00
• <b>Project Management for all the work in the Development Phase</b>			
Cost:			5,000,000.00
• <b>Other cost categories (if needed)</b>			
Office Space (Paid by Pipeline Cost)			0.00
Travel, Transportation			2,000,000.00
Computer Simulation			5,000,000.00
Legal (for EIS application)			5,000,000.00
Insurance			1,000,000.00
Tax			0.00
Office Support			200,000.00
Cost:			13,200,000.00

**Application should document the data and methods used to estimate:**

• <b>Work Hours</b>			
Engineer	200,000	x	\$150.00
			30,000,000.00

2.5.1 Cost Estimate for Development Phase  
NGL Plant

Engineering Manager	20,000	x	\$250.00	5,000,000.00
Technician	100,000	x	\$80.00	8,000,000.00
EIS Engineer	8,000	x	\$150.00	1,200,000.00
Clerical	10,000	x	\$60.00	600,000.00
Miscellaneous Staff	2,000	x	\$100.00	200,000.00
Lawyer	5,000	x	\$250.00	1,250,000.00
				46,250,000.00

- **Hourly Costs**

Engineer	\$150.00
EIS Engineer	\$150.00
Engineering Manager	\$250.00
Technician	\$80.00
Clerical	\$60.00
Miscellaneous Staff	\$100.00
Lawyers	\$250.00

- **Resource Requirements**

This development phase will cost \$84.45 million and will be funded by Sinopec through a loan and will be repaid as soon as the construction loan is obtained.

Total Cost: \$84,450,000.00

2.5.1 Cost Estimate for Development Phase  
Marine Terminal

**2.5.1 - Cost Estimate for Development Phase**

**2.5.1.4 - Marine Terminal Cost (Development Phase)**

• <b>Front End Engineering Design, including (but not limited to)</b>			
o <b>Route and Site Selection</b>			
Cost:			2,000,000.00
o <b>Basis of Design (e.g., line sizing and throughput determination, compression station locations and horsepower)</b>			
Cost:			52,400,000.00
o <b>Technology Assessments</b>			
Cost:			2,000,000.00
o <b>Environmental Impact Studies and Assessments</b>			
The \$15 million cost for this EIS is included in the Basis of Design above.			
Cost:			0.00
o <b>Right-of-Way Determination and Negotiations</b>			
Cost:			2,000,000.00
• <b>Regulatory and Permitting Activities including (but not limited to).</b>			
o <b>Preparation of FERC, NEB, NPA, RCA applications</b>			
o <b>Costs Associated with FERC, NEB, NPA, and RECA approvals</b>			
o <b>Preparation of applications for other permits.</b>			
Cost:			30,000,000.00
• <b>Project Management for all the work in the Development Phase</b>			
Cost:			22,000,000.00
• <b>Other cost categories (if needed)</b>			
Office			0.00
Computer Simulation			5,000,000.00
Travel			2,000,000.00
Public Relations			1,000,000.00
Cost			8,000,000.00

**Application should document the data and methods used to estimate:**

• <b>Work Hours</b>				
Marine Engineer	100,000.00	x	\$150.00	15,000,000.00
Engineer	40,000	x	\$150.00	6,000,000.00
Engineering Manager	10,000	x	\$250.00	2,500,000.00
Technician	100,000	x	\$80.00	8,000,000.00

## 2.5.1 Cost Estimate for Development Phase

### Marine Terminal

EIS Engineer	100,000	x	\$150.00	15,000,000.00
Clerical	40,000	x	\$60.00	2,400,000.00
Miscellaneous Staff	10,000	x	\$100.00	1,000,000.00
Lawyer	10,000	x	\$250.00	2,500,000.00
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				52,400,000.00

- **Hourly Costs**

Marine Engineer	\$150.00
Engineer	\$150.00
EIS Engineer	\$150.00
Engineering Manager	\$250.00
Technician	\$80.00
Clerical	\$60.00
Miscellaneous Staff	\$100.00

- **Resource Requirements**

The cost of this work is \$118.4 million, which will be funded by Sinopec in a loan and will be repaid as soon as the construction loan is in place.

Total Cost: \$118,400,000.00

**2.5.1 - Cost Estimate for Development Phase**

**2.5.1.5 - LNG Shipping, Alaska LNG Shipping Fleet**

There will be no cost associated in the development phase.



2.5.2 Cost Estimate for Execution Phase  
Pipeline and Compression Station Cost

**2.5.2 - Cost Estimate for Execution Phase**

**2.5.2.1 - Pipeline and Compression Station Cost (Execution Phase)**

• <b>Estimated costs for Detailed Engineering and Early Procurement activities that occur before the Execution Phase begins will be included in the Project Execution Cost Estimate.</b>			
• <b>Detailed Engineering, Procurement and Project Management services by contractors:</b>			
Cost:			\$422,252,000.00
• <b>Direct Materials (e.g., line pipe, valves, engineering equipment such as compressors and process equipment, electrical and instrumentation and other materials such as structural steel, concrete, process piping, etc.)</b>			
Cost:			\$8,340,000,000.00
• <b>Construction Costs (e.g., management, supervision, construction equipment, direct labor, and temporary construction, indirect field labor and field overhead costs).</b>			
Cost:			\$8,200,000,000.00
• <b>Right-of-Way and Land Acquisition.</b>			
Cost:			\$100,000,000.00
• <b>Engineered equipment and material quantities and costs.</b>			
o <b>Costs related to Engineering Design</b>			
Office Space Rental			\$1,008,000.00
Travel, Transportation			\$10,000,000.00
Computer Simulation and Modeling			\$15,000,000.00
Public Relations			\$30,000,000.00
Legal			\$11,670,000.00
Insurance			\$3,700,000.00
Tax			\$3,000,000.00
Office Support			\$2,000,000.00
Engineer Support			\$2,000,000.00
Washington D.C. Lawyer			\$50,000,000.00
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			\$128,378,000.00
Total Cost			\$17,190,630,000.00

**Applicant should document the data and methods used to estimate:**

• Work Hours			
Engineer	1,000,000	x	\$150.00
Engineering Manager	200,000	x	\$250.00
			\$150,000,000.00
			\$50,000,000.00

2.5.2 Cost Estimate for Execution Phase  
Pipeline and Compression Station Cost

Technician	500,000	x	\$80.00	\$40,000,000.00
Clerical	50,000	x	\$60.00	\$3,000,000.00
Lawyer	47,000	x	\$250.00	\$11,750,000.00
Misc. Staff	25,000	x	\$100.00	\$2,500,000.00
EIS Engineer	100,000	x	\$150.00	\$15,000,000.00
Const. Project Mgmt.	500,000	x	\$200.00	\$100,000,000.00
Washington DC Lawye	125,000	x	\$400.00	\$50,000,000.00
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				\$422,250,000.00

- **Hourly costs for engineering, project management and construction labor.**

Engineer	\$150.00	Hourly
EIS Engineer	\$150.00	Hourly
Engineering Manager	\$250.00	Hourly
Technical	\$80.00	Hourly
Clerical	\$60.00	Hourly
Lawyer	\$250.00	Hourly
Misc. Staff	\$100.00	Hourly
Const. Project Mgmt.	\$200.00	Hourly
Washington DC Lawye	\$400.00	Hourly
Non-Skilled Const. Labor	\$65.00	Hourly
Skilled Const. Labor	\$85.00	Hourly

- **Hourly Costs**

Environmental Engineer	\$150.00	Hourly
Engineers	\$150.00	Hourly
Engineering Manager	\$250.00	Hourly
Technical	\$80.00	Hourly
Clerical	\$60.00	Hourly
Lawyer	\$250.00	Hourly
Misc. Staff	\$100.00	Hourly

- **Resource Requirements**

This plan total cost of \$17.19 billion will be funded by US Government guaranteed bonds, and state and private funding. The engineering service of \$422+ million will be funded by Sinopec through a loan agreement which will be repaid to Sinopec once the construction loan is in place.

2.5.2 Cost Estimate for Execution Phase  
LNG Plants

**2.5.2 - Cost Estimate for Execution Phase**

**2.5.2.2 - Cost Estimate for LNG Plants (Execution Phase)**

- **Estimated costs for Detailed Engineering and Early Procurement activities that occur before the Execution Phase begins will be included in the Project Execution Cost Estimate.**
- **Detailed Engineering, Procurement and Project Management services by contractors:**  
Cost: \$327,300,000.00
- **Direct Materials (e.g., line pipe, valves, engineering equipment such as compressors and process equipment, electrical and instrumentation and other materials such as structural steel, concrete, process piping, etc.)**  
Cost: \$7,510,000,000.00
- **Construction Costs (e.g., management, supervision, construction equipment, direct labor, and temporary construction, indirect field labor and field overhead costs).**  
Cost: \$2,400,000,000.00
- **Right-of-Way and Land Acquisition.**  
Cost: \$100,000,000.00
- **Engineered equipment and material quantities and costs.**
  - o **Costs Related to Engineering Design**

Office Space Rental	\$1,080,000.00
Travel, Transportation	\$5,000,000.00
Computer Simulation and Modeling	\$15,000,000.00
Public Relations	\$30,000,000.00
Legal	\$11,670,000.00
Insurance	\$1,500,000.00
Tax	\$1,500,000.00
Office Supply	\$2,000,000.00
Engineer Equipment	\$2,000,000.00
Washington D.C. Lawyer	\$30,000,000.00
	\$99,750,000.00

**Applicant should document the data and methods used to estimate:**

- **Work Hours**

Engineer	1,000,000	x	\$150.00	\$150,000,000.00
Engineering Manager	150,000	x	\$250.00	\$37,500,000.00
Technician	200,000	x	\$80.00	\$16,000,000.00
Clerical	30,000	x	\$60.00	\$1,800,000.00
Lawyer	20,000	x	\$250.00	\$5,000,000.00

## 2.5.2 Cost Estimate for Execution Phase

### LNG Plants

Misc. Staff	20,000	x	\$100.00	\$2,000,000.00
EIS Engineer	100,000	x	\$150.00	\$15,000,000.00
Const. Project Mgmt.	500,000	x	\$200.00	\$100,000,000.00
				<hr/>
				\$327,300,000.00

- **Hourly costs for engineering, project management and construction labor.**

Engineer	\$150.00	Hourly
EIS Engineer	\$150.00	Hourly
Engineering Manager	\$250.00	Hourly
Technical	\$80.00	Hourly
Clerical	\$60.00	Hourly
Lawyer	\$250.00	Hourly
Misc. Staff	\$100.00	Hourly
Const. Project Mgr.	\$200.00	Hourly
Non-Skilled Const.Labo	\$65.00	Hourly
Skilled Const. Labor	\$85.00	Hourly
Heavy Eqpt. Operator	\$90.00	Hourly

- **Engineering, project management and construction resource requirements.**

The total resource is \$10.437 billion million which will come from U.S. Government guaranteed bonds and state and private funding. For the \$327.3 million engineering fee, a loan from Sinopec will providing the funding which will later be repaid to Sinopec once the construction loan is in place.

Total Cost: \$10,437,050,000.00

## **2.5.2 - Cost Estimate for Execution Phase**

### **2.5.2.3 - Cost Estimate for NGL Plants (Execution Phase)**

- **Estimated costs for Detailed Engineering and Early Procurement activities that occur before the Execution Phase begins will be included in the Project Execution Cost Estimate.**
- **Detailed Engineering, Procurement and Project Management services by contractors:**  
Detailed engineering costs for this phase is \$128,900,000.00  
Cost: \$128,900,000.00
- **Direct Materials (e.g., line pipe, valves, engineering equipment such as compressors and process equipment, electrical and instrumentation and other materials such as structural steel, concrete, process piping, etc.)**  
NGL plant will be built in China in modules and shipped to the site for reassembly.  
Costs for materials are reflected in Construction Costs below.
- **Construction Costs (e.g., management, supervision, construction equipment, direct labor, and temporary construction, indirect field labor and field overhead costs).**  
Cost: \$2,301,000,000.00
- **Right-of-Way and Land Acquisition.**  
Cost: \$50,000,000.00

**Applicant should document the data and methods used to estimate:**

- **Work Hours**

Engineer	400,000	x	\$150.00	\$60,000,000.00
Engineering Manager	10,000	x	\$250.00	\$2,500,000.00
Technician	100,000	x	\$80.00	\$8,000,000.00
Clerical	40,000	x	\$60.00	\$2,400,000.00
Misc. Staff	10,000	x	\$100.00	\$1,000,000.00
Const. Project Manager	200,000	x	\$200.00	\$40,000,000.00
EIS Engineer	100,000	x	\$150.00	\$15,000,000.00
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				\$128,900,000.00

- **Hourly costs for engineering, project management and construction labor.**

Engineer	\$150.00	Hourly
EIS Engineer	\$150.00	Hourly
Engineering Manager	\$250.00	Hourly
Technical	\$80.00	Hourly
Clerical	\$60.00	Hourly
Lawyer	\$250.00	Hourly
Misc. Staff	\$100.00	Hourly

2.5.2 Cost Estimate for Execution Phase  
NGL Plants

Construction Project Mg	\$200.00	Hourly
Non-Skilled Cosntruction	\$65.00	Hourly
Skilled Construction Lal	\$85.00	Hourly
Heavy Equipment Operæ	\$90.00	Hourly

- **Engineered equipment and material quantities and costs.**

Office Space Rental	\$0.00
Travel	\$2,000,000.00
Computer Simulation and Modeling	\$2,000,000.00
Public Relations	\$10,200,000.00
Legal	\$5,000,000.00
Insurance	\$1,500,000.00
Office Supply	\$500,000.00
Engineer Equipment	\$2,000,000.00
Washington D.C. Lawyer	\$10,000,000.00
	\$33,200,000.00

- **Engineering, project management and construction resource requirements.**

The total resources for this proejct is \$2,479,900,000.00 which will come from U.S. Government guaranteed bonds and state and private funding. The \$128.9 million engineering FEED fee will be funded by Sinopec through a loan agreement, and this money will be repaid to Sinopec as soon as the construction funding is inplace.

Total Cost: \$2,479,900,000.00

2.5.2 Cost Estimate for Execution Phase  
Marine Terminal

**2.5.2 - Cost Estimate for Execution Phase**

**2.5.2.4 - Cost Estimate for Marine Terminal (Execution Phase)**

- **Estimated costs for Detailed Engineering and Early Procurement activities that occur before the Execution Phase begins will be includes in the Project Execution Estimate.**
- **Detailed Engineering, Procurement and Project Management services by contractors:**  
Cost: \$119,600,000.00
- **Direct Materials (e.g., line pipe, valves, engineering equipment such as compressors and process equipment, electrical and instrumentation and other materials such as structural steel, concrete, process piping, etc.)**  
Marine terminal includes a 20 million gallon storage tank for LNG and NGL liquids.  
Cost: \$860,000,000.00
- **Construction Costs (e.g., management, supervision, construction equipment, direct labor, and temporary construction, indirect field labor and field overhead costs).**  
Construction cost of the marine terminal will be \$1.682 billion.  
Cost: \$1,682,000,000.00
- **Environmental Impact Statement:**  
The \$30 million cost for EIS is already included in Detailed Engineering above.  
Cost: \$0.00
- **Right-of-Way and Land Acquisition.**  
Cost: \$20,000,000.00
- **Other cost categories (if needed).**  
Computer simulation model cost: \$5,000,000.00

Total Cost \$2,686,600,000.00

**Applicant should document the data and methods used to estimate:**

• <b>Work Hours</b>				
Engineer	200,000	x	\$150.00	\$30,000,000.00
Engineering Manager	50,000	x	\$250.00	\$12,500,000.00
Marine Engineer	100,000	x	\$150.00	\$15,000,000.00
Technician	100,000	x	\$80.00	\$8,000,000.00
Clerical	10,000	x	\$60.00	\$600,000.00
Lawyer	10,000	x	\$250.00	\$2,500,000.00
Misc. Staff	10,000	x	\$100.00	\$1,000,000.00
EIS Engineer	200,000	x	\$150.00	\$30,000,000.00

2.5.2 Cost Estimate for Execution Phase  
Marine Terminal

Const. Project Mgmt.	100,000	x	\$200.00	<u>\$20,000,000.00</u>
				\$119,600,000.00

- **Hourly costs for engineering, project management and construction labor.**

Engineer	\$150.00	Hourly
EIS Engineer	\$150.00	Hourly
Engineering Manager	\$250.00	Hourly
Marine Engineer	\$150.00	Hourly
Technical	\$80.00	Hourly
Clerical	\$60.00	Hourly
Const. Project Mgr.	\$200.00	Hourly
Non-Skilled Const Labo	\$65.00	Hourly
Skilled Const. Labor	\$85.00	Hourly
Heavy Eqpt. Operator	\$90.00	Hourly

- **Engineering, project management and construction resource requirements.**

The total resource is \$2,686,600,000.00 which will be funded by U.S. Government guaranteed bonds, state and private funding. For the FEED, Sinopec will provide the funding through a loan agreement to fund and the \$119.6 million engineering cost which will be repaid as soon as the construction loan is in place.

2.5.2 Cost Estimate for Execution Phase  
LNG Shipping Fleet Procurement

**2.5.2 - Cost Estimate for Execution Phase**

**2.5.2.5 - Cost Estimate for LNG Shipping Fleet (Execution Phase)**

For LNG shipping fleet, once the construction loan is in place, LSCC/Sinopec will place an order with the ship building industry for a long term lease for the following:

- 1 - 20 LNG ships with 145,000 to 180,000 M<sup>3</sup> capacity @ \$300 million ea. (non-Jones Act ships)
- 2 - 4 LNG ships with 75,000 M<sup>3</sup> capacity at \$250 million each (Jones Act ships).

Non-Jones Acts Ships	20	x	300,000,000.00	\$6,000,000,000.00
Jones Act Ships	4	x	250,000,000.00	<u>\$1,000,000,000.00</u>
Total				\$7,000,000,000.00

These 24 LNG ships, either by leasing from a shipping company, or built by a China ship yard and leased to Sinopec for shipping LNG to China, the cost of this item is not included in the in the pipeline project.

## Annual Revenue and Cost Breakdown at \$7.00/MMBTU

### Revenue

Assume shippers agree to commit to 4.5 BCF/D or 1,642.5 BCF/A

BCF/A for China	1,460
BCF/A for Alaska	183
	1,643

Assume LNG is selling for \$8.00 per MMBTU to China

(\$7.00 per MMBTU = \$7.00 per 1,000 CF)

1,460.00 BCF/A                      7.00 MCF =                      10,220,000,000

Assume 0.5 BCF/D for Alaska Sales

182.50 BCF/A                      3.79 MCF =                      691,675,000

**Total Revenue** **\$10,911,675,000**

Tariff = \$4.106 + 15% Profit to Operator = \$4.722

Tariff: LNG =                      4.722 /MCF x                      1,460.00 BCF/A                      6,893,974,000

Tariff: Spur Line                      1.526 /MCF x                      182.50 BCF/A                      278,495,000

Total Tariff 7,172,469,000

Net Revenue Before Tax (\$10.912 - \$7.172 = \$3.739 Billion) \$3,739,206,000

North Slope Producer                      0.875 Share =                      3,271,805,250

State of Alaska Royalty                      0.125 Royalty =                      467,400,750

Pipeline Operator Income                      0.150 % of Tariff                      1,075,870,350

State of Alaska Property Tax                      0.020 Tax =                      \$32.78B\*                      655,600,000

Producers AK Corp. Tax                      0.094 Corp Tax =                      307,549,694

Pipeline Opr. AK Corp Tax                      0.094 Pipeline Operator Profit Tax                      101,131,813

Producer Fed. Corp. Tax                      0.350 Corp Tax =                      1,145,131,838

Pipeline Opr. Fed. Corp. Tax                      0.350 Corp Tax =                      376,554,623

### Total State of Alaska Revenue:

12.5% Royalty	467,400,750
2% Property Tax	655,600,000
9.4% Corporate Tax on Producer	307,549,694
9.4% Corporate Tax on Pipeline Operations	101,131,813
2% Property Tax on North Slope GTP (\$2.1 Billion)	42,000,000
	\$1,573,682,256

### Total Federal Government Revenue:

35% of Producer Income of \$3,379,206,000 1,145,131,838

35% of Pipeline Operator Income of \$1,075,870,350 376,554,623

Total Federal Government Revenue \$1,521,686,460

**Total North Slope Producers Revenue:**

Total Revenue from 87.5% Share (above)	3,271,805,250
Less State 9.4% Corporate Tax	307,549,694
Less Federal 35% Corporate Tax	1,145,131,838
Less Federal Tax on GTP (\$2.1 Billion x 2%)	42,000,000
Subtotal	1,777,123,719
Plus GTP Tarrif of \$0.464 x 1,643 BCF/A	762,352,000
Total Revenue After Taxes	\$2,539,475,719

**Total LSCC/Sinopec Revenue as Pipeline and LNG Plant Operator:**

Total Revenue = 15% of Tariff	1,075,870,350
Less Federal Corporate Tax of 35%	376,554,623
Less State Corporate Tax of 9.4%	101,131,813
Total Revenue After Taxes	\$598,183,915

\*\$32.78 Billion = Estimated Project Construction Cost

## Revenue

Total Revenue = 15% of Tariff	1,075,870.350
-------------------------------	---------------

Less Federal Corporate Tax of 35%	376,554,623
Less State Corporate Tax of 9.4%	<u>101,131,813</u>
Total Revenue After Taxes	\$598,183,915

\*\$32.78 Billion = Estimated Project Construction Cost

## Annual Revenue and Cost Breakdown at \$9.00/MMBTU

### Revenue

Assume shippers agree to commit to 4.5 BCF/D or 1,642.5 BCF/A

BCF/A for China	1,460
BCF/A for Alaska	183
	<u>1,643</u>

Assume LNG is selling for \$9.00 per MMBTU to China

(\$9.00 per MMBTU = \$9.00 per 1,000 CF)

1,460.00 BCF/A 9.00 MCF = 13,140,000,000

Assume 0.5 BCF/D for Alaska Sales

182.50 BCF/A 3.79 MCF = 691,675,000

### Total Revenue

#####

Tariff = \$4.106 + 15% Profit to Operator = \$4.722

Tariff: LNG = 4.722 /MCF x 1,460.00 BCF/A 6,893,974,000

Tariff: Spur Line 1.526 /MCF x 182.50 BCF/A 278,495,000

Total Tariff 7,172,469,000

Net Revenue Before Tax (\$13.832 - \$7.172 = \$6.659 Billion) \$6,659,206,000

North Slope Producer 0.875 Share = 5,826,805,250

State of Alaska Royalty 0.125 Royalty = 832,400,750

Pipeline Operator Income 0.150 % of Tariff 1,075,870,350

State of Alaska Property Tax 0.020 Tax = \$32.78B\* 655,600,000

Producers AK Corp. Tax 0.094 Corp Tax = 547,719,694

Pipeline Opr. AK Corp Tax 0.094 Pipeline Operator Profit Tax 101,131,813

Producer Fed. Corp. Tax 0.350 Corp Tax = 2,039,381,838

Pipeline Opr. Fed. Corp. Tax 0.350 Corp Tax = 376,554,623

### Total State of Alaska Revenue:

12.5% Royalty 832,400,750

2% Property Tax 655,600,000

9.4% Corporate Tax on Producer 547,719,694

9.4% Corporate Tax on Pipeline Operations 101,131,813

2% Property Tax on North Slope GTP (\$2.1 Billion) 42,000,000

\$2,178,852,256

### Total Federal Government Revenue:

35% of Producer Income of \$5,826,805,250 2,039,381,838

35% of Pipeline Operator Income of \$1,075,870,350 376,554,623

Total Federal Government Revenue \$2,415,936,460

### Total North Slope Producers Revenue:

Total Revenue from 87.5% Share (above) 5,826,805,250

Less State 9.4% Corporate Tax 547,719,694

Less Federal 35% Corporate Tax 2,039,381,838

Less Federal Tax on GTP (\$2.1 Billion x 2%) 42,000,000

Subtotal 3,197,703,719

Plus GTP Tariff of \$0.464 x 1,643 BCF/A 762,352,000

Total Revenue After Taxes \$3,960,055,719

### Total LSCC/Sinopec Revenue as Pipeline and LNG Plant Operator:

Total Revenue = 15% of Tariff 1,075,870,350

Less Federal Corporate Tax of 35%	376,554,623
Less State Corporate Tax of 9.4%	<u>101,131,813</u>
Total Revenue After Taxes	\$598,183,915

\*\$32.78 Billion = Estimated Project Construction Cost

## Annual Revenue and Cost Breakdown at \$10.00/MMBTU

### Revenue

Assume shippers agree to commit to 4.5 BCF/D or 1,642.5 BCF/A

BCF/A for China	1,460
BCF/A for Alaska	183
	1,643

Assume LNG is selling for \$10.00 per MMBTU to China  
(\$10.00 per MMBTU = \$10.00 per 1,000 CF)

1,460.00 BCF/A                      10.00 MCF =                      14,600,000,000

Assume 0.5 BCF/D for Alaska Sales

182.50 BCF/A                      3.79 MCF =                      691,675,000

**Total Revenue** **\$15,291,675,000**

Tariff = \$4.106 + 15% Profit to Operator = \$4.722

Tariff: LNG =                      4.722 /MCF x                      1,460.00 BCF/A                      6,893,974,000

Tariff: Spur Line                      1.526 /MCF x                      182.50 BCF/A                      278,495,000

Total Tariff 7,172,469,000

Net Revenue Before Tax (\$15.292 - \$7.172 = \$8.119 Billion) \$8,119,206,000

North Slope Producer                      0.875 Share =                      7,104,305,250

State of Alaska Royalty                      0.125 Royalty =                      1,014,900,750

Pipeline Operator Income                      0.150 % of Tariff                      1,075,870,350

State of Alaska Property Tax                      0.020 Tax =                      \$32.78B\*                      655,600,000

Producers AK Corp. Tax                      0.094 Corp Tax =                      667,804,694

Pipeline Opr. AK Corp Tax                      0.094 Pipeline Operator Profit Tax                      101,131,813

Producer Fed. Corp. Tax                      0.350 Corp Tax =                      2,486,506,838

Pipeline Opr. Fed. Corp. Tax                      0.350 Corp Tax =                      376,554,623

### Total State of Alaska Revenue:

12.5% Royalty 1,014,900,750

2% Property Tax 655,600,000

9.4% Corporate Tax on Producer 667,804,694

9.4% Corporate Tax on Pipeline Operations 101,131,813

2% Property Tax on North Slope GTP (\$2.1 Billion) 42,000,000

**\$2,481,437,256**

### Total Federal Government Revenue:

35% of Producer Income of \$7,104,305,250 2,486,506,838

35% of Pipeline Operator Income of \$1,075,870,350 376,554,623

Total Federal Government Revenue **\$2,863,061,460**

**Total North Slope Producers Revenue:**

Total Revenue from 87.5% Share (above)	7,104,305,250
Less State 9.4% Corporate Tax	667,804,694
Less Federal 35% Corporate Tax	2,486,506,838
Less Federal Tax on GTP (\$2.1 Billion x 2%)	42,000,000
Subtotal	3,907,993,719
Plus GTP Tarrif of \$0.464 x 1,643 BCF/A	762,352,000
Total Revenue After Taxes	\$4,670,345,719

**Total LSCC/Sinopec Revenue as Pipeline and LNG Plant Operator:**

Total Revenue = 15% of Tariff	1,075,870,350
Less Federal Corporate Tax of 35%	376,554,623
Less State Corporate Tax of 9.4%	101,131,813
Total Revenue After Taxes	\$598,183,915

\*\$32.78 Billion = Estimated Project Construction Cost

## Annual Revenue and Cost Breakdown at \$11.00/MMBTU

### Revenue

Assume shippers agree to commit to 4.5 BCF/D or 1,642.5 BCF/A

BCF/A for China	1,460
BCF/A for Alaska	183
	1,643

Assume LNG is selling for \$11.00 per MMBTU to China  
(\$11.00 per MMBTU = \$11.00 per 1,000 CF)

1,460.00 BCF/A                      11.00 MCF =                      16,060,000,000

Assume 0.5 BCF/D for Alaska Sales

182.50 BCF/A                      3.79 MCF =                      691,675,000

**Total Revenue** **\$16,751,675,000**

Tariff = \$4.106 + 15% Profit to Operator = \$4.722

Tariff: LNG =                      4.722 /MCF x                      1,460.00 BCF/A                      6,893,974,000

Tariff: Spur Line                      1.526 /MCF x                      182.50 BCF/A                      278,495,000

Total Tariff 7,172,469,000

Net Revenue Before Tax (\$16.752 - \$7.172 = \$9.579 Billion) \$9,579,206,000

North Slope Producer                      0.875 Share =                      8,381,805,250

State of Alaska Royalty                      0.125 Royalty =                      1,197,400,750

Pipeline Operator Income                      0.150 % of Tariff                      1,075,870,350

State of Alaska Property Tax                      0.020 Tax =                      \$32.78B\*                      655,600,000

Producers AK Corp. Tax                      0.094 Corp Tax =                      787,889,694

Pipeline Opr. AK Corp Tax                      0.094 Pipeline Operator Profit Tax                      101,131,813

Producer Fed. Corp. Tax                      0.350 Corp Tax =                      2,933,631,838

Pipeline Opr. Fed. Corp. Tax                      0.350 Corp Tax =                      376,554,623

### Total State of Alaska Revenue:

12.5% Royalty 1,197,400,750

2% Property Tax 655,600,000

9.4% Corporate Tax on Producer 787,889,694

9.4% Corporate Tax on Pipeline Operations 101,131,813

2% Property Tax on North Slope GTP (\$2.1 Billion) 42,000,000

**\$2,784,022,256**

### Total Federal Government Revenue:

35% of Producer Income of \$8,381,805,250 2,933,631,838

35% of Pipeline Operator Income of \$1,075,870,350 376,554,623

Total Federal Government Revenue **\$3,310,186,460**

**Total North Slope Producers Revenue:**

Total Revenue from 87.5% Share (above)	8,381,805,250
Less State 9.4% Corporate Tax	787,889,694
Less Federal 35% Corporate Tax	2,933,631,838
Less Federal Tax on GTP (\$2.1 Billion x 2%)	42,000,000
Subtotal	4,618,283,719
Plus GTP Tarrif of \$0.464 x 1,643 BCF/A	762,352,000
Total Revenue After Taxes	\$5,380,635,719

**Total LSCC/Sinopec Revenue as Pipeline and LNG Plant Operator:**

Total Revenue = 15% of Tariff	1,075,870,350
Less Federal Corporate Tax of 35%	376,554,623
Less State Corporate Tax of 9.4%	101,131,813
Total Revenue After Taxes	\$598,183,915

\*\$32.78 Billion = Estimated Project Construction Cost

## Annual Revenue and Cost Breakdown at \$12.00/MMBTU

### Revenue

Assume shippers agree to commit to 4.5 BCF/D or 1,642.5 BCF/A

BCF/A for China	1,460
BCF/A for Alaska	183
	1,643

Assume LNG is selling for \$12.00 per MMBTU to China  
(\$12.00 per MMBTU = \$12.00 per 1,000 CF)

1,460.00 BCF/A                      12.00 MCF =                      17,520,000,000

Assume 0.5 BCF/D for Alaska Sales

182.50 BCF/A                      3.79 MCF =                      691,675,000

**Total Revenue** **\$18,211,675,000**

Tariff = \$4.106 + 15% Profit to Operator = \$4.722

Tariff: LNG =                      4.722 /MCF x                      1,460.00 BCF/A                      6,893,974,000

Tariff: Spur Line                      1.526 /MCF x                      182.50 BCF/A                      278,495,000

Total Tariff 7,172,469,000

Net Revenue Before Tax (\$18.212 - \$7.172 = \$11.039 Billion) \$11,039,206,000

North Slope Producer                      0.875 Share =                      9,659,305,250

State of Alaska Royalty                      0.125 Royalty =                      1,379,900,750

Pipeline Operator Income                      0.150 % of Tariff                      1,075,870,350

State of Alaska Property Tax                      0.020 Tax =                      \$32.78B\*                      655,600,000

Producers AK Corp. Tax                      0.094 Corp Tax =                      907,974,694

Pipeline Opr. AK Corp Tax                      0.094 Pipeline Operator Profit Tax                      101,131,813

Producer Fed. Corp. Tax                      0.350 Corp Tax =                      3,380,756,838

Pipeline Opr. Fed. Corp. Tax                      0.350 Corp Tax =                      376,554,623

### Total State of Alaska Revenue:

12.5% Royalty 1,379,900,750

2% Property Tax 655,600,000

9.4% Corporate Tax on Producer 907,974,694

9.4% Corporate Tax on Pipeline Operations 101,131,813

2% Property Tax on North Slope GTP (\$2.1 Billion) 42,000,000

**\$3,086,607,256**

### Total Federal Government Revenue:

35% of Producer Income of \$9,659,305,250 3,380,756,838

35% of Pipeline Operator Income of \$1,075,870,350 376,554,623

Total Federal Government Revenue **\$3,757,311,460**

**Total North Slope Producers Revenue:**

Total Revenue from 87.5% Share (above)	9,659,305,250
Less State 9.4% Corporate Tax	907,974,694
Less Federal 35% Corporate Tax	3,380,756,838
Less Federal Tax on GTP (\$2.1 Billion x 2%)	42,000,000
Subtotal	5,328,573,719
Plus GTP Tarrif of \$0.464 x 1,643 BCF/A	762,352,000
Total Revenue After Taxes	\$6,090,925,719

**Total LSCC/Sinopec Revenue as Pipeline and LNG Plant Operator:**

Total Revenue = 15% of Tariff	1,075,870,350
Less Federal Corporate Tax of 35%	376,554,623
Less State Corporate Tax of 9.4%	101,131,813
Total Revenue After Taxes	\$598,183,915

\*\$32.78 Billion = Estimated Project Construction Cost

## Natural Gas Pipeline Flow Calculation Formulas

Weymouth Equation:

$$q_{sc} = 433.49 \left[ \frac{T_m}{P_m} \right]^{1.0} \left[ \frac{(P_1^2 - e^f P_2^2) d^{5.333}}{\gamma L_e T_m Z_m} \right]^{0.5} E$$

$$f_f = \frac{0.008}{d^{0.35}}$$

Panhandle A:

$$q_{sc} = 433.87 \left[ \frac{T_m}{P_m} \right]^{1.0708} \left[ \frac{(P_1^2 - e^f P_2^2) d^{4.854}}{\gamma^{0.8541} L_e T_m Z_m} \right]^{0.5394} E$$

$$f_f = \frac{0.0192}{(q_{sc} \gamma / d)^{0.1461}}$$

Panhandle B:

$$q_{sc} = 737 \left[ \frac{T_m}{P_m} \right]^{1.02} \left[ \frac{(P_1^2 - e^f P_2^2) d^{4.951}}{\gamma^{0.981} L_e T_m Z_m} \right]^{0.51} E$$

$$f_f = \frac{0.00359}{(q_{sc} \gamma / d)^{0.00922}}$$

AGA (fully turbulent):

$$q_{sc} = 38.774 \left[ \frac{T_m}{P_m} \right]^{1.0} \left[ \frac{(P_1^2 - e^f P_2^2) d^5}{\gamma^{0.961} L_e T_m Z_m} \right]^{0.5} F_t$$

$$F_t = 4 \log(3.74d / \epsilon)$$

$$f_f = 1 / F_t^2$$

Ohirhian:

$$q_{sc} = -2000 \times \log \left[ \frac{\epsilon}{3.7d} + \frac{2.51}{x} \right] \left[ \frac{\mu d}{20.14 \gamma} \right]$$

$$x = 55.129726 \left[ \frac{(P_1^2 - e^f P_2^2) \gamma d^3}{L_e T_m Z_m \mu^2} \right]^{-0.5}$$

$$f_f = \frac{1}{4} \left[ \frac{x \mu d}{0.02014 q_{sc} \gamma} \right]^2$$

elev. Diff. Noted  
I.P. = 2500 psia  
O.P. = 2000 psia  
STP, 14.7 psia, 60 deg F  
mean temp 40 F  
48" I.D. pipe  
distance L noted

relative density = 0.65  
mean compressibility = 0.8869  
efficiency = 0.95  
rough = 100 x 10EE-6  
mean viscosity = 0.03

Where:

$q_{sc}$  = gas rate at standard condition,  
scf/d

$P_1$  = inlet pressure, psia

$P_2$  = outlet pressure, psia

$P_{sc}$  = pressure at standard condition,  
psia

$T_{sc}$  = temperature at standard condition,  
&degR

$T_m$  = mean temperature of line, &degR

$T_g$  = ground temperature, &degR

$\mu$  = mean gas viscosity, cp

$\gamma$  = mean gas relative density (air = 1)

$Z_m$  = mean gas compressibility factor

$d$  = inside diameter of pipe, inches

$L$  = pipe length, miles

$L_e$  = effective pipe length, miles

$\Delta H$  = Change in elevation between inlet  
& outlet (ft)

$E$  = pipeline efficiency

$f_m$  = Moody friction factor

$f_f$  = Fanning friction factor

$F_t$  = transmission factor ( $\sqrt{1/f_f}$ )

$\epsilon$  = absolute roughness of pipe, inches

$$S = \frac{0.0375 \gamma \Delta H}{T_m Z_m}$$

$$L_e = \frac{(e^f - 1)L}{S}$$

The mean values of the gas properties  
( $Z$  &  $\mu$ ) are determined at the average  
pressure and temperature,  
derived as follows:

$$P_m = \frac{2}{3} \left[ \frac{P_1^3 - P_2^3}{P_1^2 - P_2^2} \right]$$

$$T_m = \frac{T_1 - T_2}{\ln \left( \frac{T_1 - T_g}{T_2 - T_g} \right)} + T_g$$

Compressor Stations @ 80 mile separation						10 Stations			SCF / day		
CS #	begin M.P. no.	end M.P. no.	begin elev	end elev	elev change	CS #	begin M.P. no.	end M.P. no.	begin elev	end elev	elev change
1	0	80	50	1400	1,350	6	400	480	900	700	-200
2	80	160	1400	2950	1,550	7	480	560	700	2100	1,400
3	160	240	2950	1200	-1,750	8	560	640	2100	2650	550
4	240	320	1200	1400	200	9	640	720	2650	2020	-630
5	320	400	1400	900	-500	10	720	800	2020	100	-1,920
10EE6 SCF / d thru-put at Comp. Station #	Weymoth					10EE6 SCF / d thru-put at Comp. Station #	Weymoth				
	Panhandle A						Panhandle A				
			Panhandle B						Panhandle B		
					AGA (fully turb- ulent)				AGA (fully turb- ulent)		
					Ohirhian				Ohirhian		
	W	P-A	P-B	AGA	O		W	P-A	P-B	AGA	O
0-1 Ff = 0.00223 max.						5-6 Ff = 0.00223 max.					
up hill	3,780.24	4,800.73	4,217.76	4,439.97	4,178.22	up hill	4,197.37	5,374.62	4,692.61	4,929.90	4,658.65
horiz.	4,145.76	5,303.36	4,633.77	4,869.28	4,599.16	horiz.	4,145.76	5,303.36	4,633.77	4,869.28	4,599.16
1-2 Ff = 0.00223 max.						6-7 Ff = 0.00223 max.					
up hill	4,136.90	5,247.39	4,613.94	4,858.88	4,569.59	dn hill	3,766.06	4,781.31	4,201.29	4,423.31	4,161.91
horiz.	4,606.40	5,892.63	5,148.63	5,410.32	5,110.17	horiz.	4,145.76	5,303.36	4,633.77	4,869.28	4,599.16
2-3 Ff = 0.00223 max.						7-8 Ff = 0.00223 max.					
dn hill	4,578.91	5,903.50	5,128.08	5,378.02	5,098.91	up hill	4,000.64	5,103.37	4,468.38	4,698.83	4,431.94
horiz.	4,145.76	5,303.36	4,633.77	4,869.28	4,599.16	horiz.	4,145.76	5,303.36	4,633.77	4,869.28	4,599.16
3-4 Ff = 0.00223 max.						8-9 Ff = 0.00223 max.					
up hill	4,093.55	5,231.34	4,574.25	4,807.96	4,538.98	dn hill	4,306.36	5,525.33	4,816.93	5,057.91	4,784.34
horiz.	4,145.76	5,303.36	4,633.77	4,869.28	4,599.16	horiz.	4,145.76	5,303.36	4,633.77	4,869.28	4,599.16
4-5 Ff = 0.00223 max.						9-10 Ff = 0.00223 max.					
dn hill	4,748.54	6,089.01	5,310.73	5,577.26	5,274.05	dn hill	4,618.98	5,959.25	5,173.86	5,425.08	5,145.18
horiz.	4,606.40	5,892.63	5,148.63	5,410.32	5,110.17	horiz.	4,145.76	5,303.36	4,633.77	4,869.28	4,599.16

20% pressure drop between stations

$$2500 \times 0.80 = 2000 \text{ section end pressure (P 2)}$$

up hill & dn hill = slope flow path

horiz. = flat flow path

Ff = calculated friction factor

Compressor Stations @ 57 mile separation						14 Stations			SCF / day		
CS #	begin M.P. no.	end M.P. no.	begin elev	end elev	elev change	CS #	begin M.P. no.	end M.P. no.	begin elev	end elev	elev change
1	0	57	50	700	650	8	399	456	1410	780	-630
2	57	114	700	1550	850	9	456	513	780	1280	500
3	114	171	1550	2450	900	10	513	570	1280	2060	780
4	171	228	2450	1100	-1350	11	570	627	2060	2900	840
5	228	285	1100	1250	150	12	627	684	2900	1580	-1320
6	285	342	1250	1000	-250	13	684	741	1580	1980	400
7	342	399	1000	1410	410	14	741	800	1980	100	-1880
10EE6 SCF / d thru-put at Comp. Station #	Weymoth <div> <div>Panhandle A</div> <div>Panhandle B</div> <div>AGA (fully turb-ulent)</div> <div>Ohirhian</div> </div>					10EE6 SCF / d thru-put at Comp. Station #	Weymoth <div> <div>Panhandle A</div> <div>Panhandle B</div> <div>AGA (fully turb-ulent)</div> <div>Ohirhian</div> </div>				
	W	P-A	P-B	AGA	O		W	P-A	P-B	AGA	O
0-1	Ff = 0.00223 max.					7-8	Ff = 0.00223 max.				
up hill	4,707.66	6,082.77	5,275.20	5,529.24	5,247.63	dn hill	5,101.74	6,633.86	5,725.99	5,992.10	5,703.27
horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21	horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21
1-2	Ff = 0.00223 max.					8-9	Ff = 0.00223 max.				
up hill	4,643.26	5,993.05	5,201.60	5,453.60	5,173.23	up hill	4,755.42	6,149.38	5,329.80	5,585.34	5,302.82
horiz.	4,911.48	6,367.36	5,508.26	5,173.23	5,483.21	horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21
2-3	Ff = 0.00223 max.					9-10	Ff = 0.00223 max.				
up hill	4,627.02	5,970.45	5,183.05	5,434.53	5,154.48	up hill	5,184.33	6,693.97	5,808.29	6,089.10	5,777.08
horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21	horiz.	5,457.20	7,074.84	6,120.29	6,409.59	6,092.45
3-4	Ff = 0.00223 max.					10-11	Ff = 0.00223 max.				
dn hill	5,901.55	7,698.26	6,629.00	6,931.50	6,606.57	up hill	4,646.50	5,997.56	5,205.30	5,457.41	5,176.97
horiz.	5,457.20	7,074.84	6,120.29	6,409.59	6,092.45	horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21
4-5	Ff = 0.00223 max.					11-12	Ff = 0.00223 max.				
up hill	5,405.73	7,002.88	6,061.41	6,349.14	6,032.95	dn hill	5,302.82	6,916.35	5,956.27	6,228.27	5,935.98
horiz.	5,457.20	7,074.84	6,120.29	6,409.59	6,092.45	horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21
5-6	Ff = 0.00223 max.					12-13	Ff = 0.00223 max.				
dn hill	5,541.99	7,193.50	6,217.30	6,509.18	6,190.51	up hill	4,787.01	6,193.46	5,365.91	5,622.45	5,339.33
horiz.	5,457.20	7,074.84	6,120.29	6,409.59	6,092.45	horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21
6-7	Ff = 0.00223 max.					13-14	Ff = 0.00223 max.				
up hill	4,783.86	6,189.06	5,362.31	5,618.75	5,335.69	dn hill	5,460.96	7,139.13	6,137.51	6,414.01	6,119.10
horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21	horiz.	4,911.48	6,367.36	5,508.26	5,768.63	5,483.21

20% pressure drop between stations

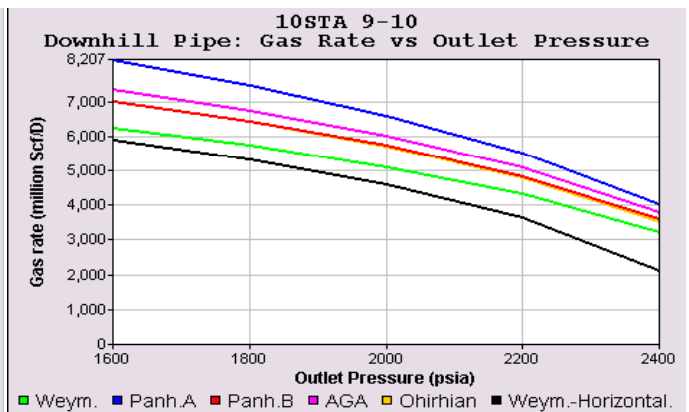
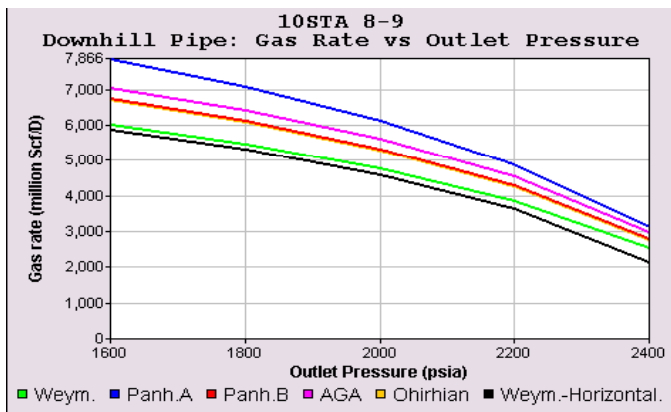
$$2500 \times 0.80 = 2000 \text{ section}$$

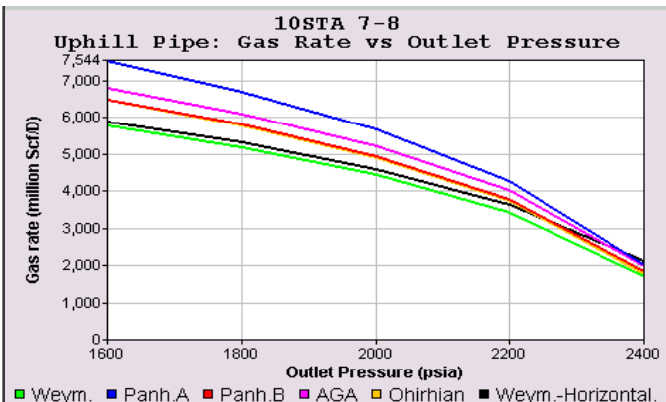
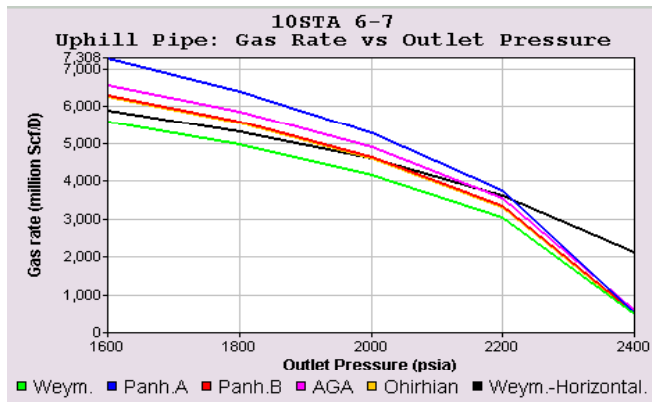
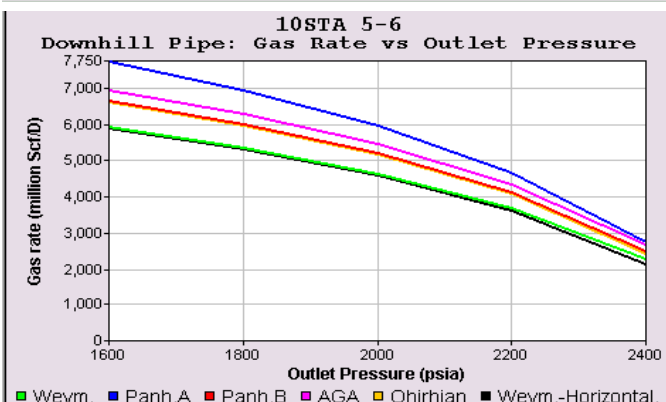
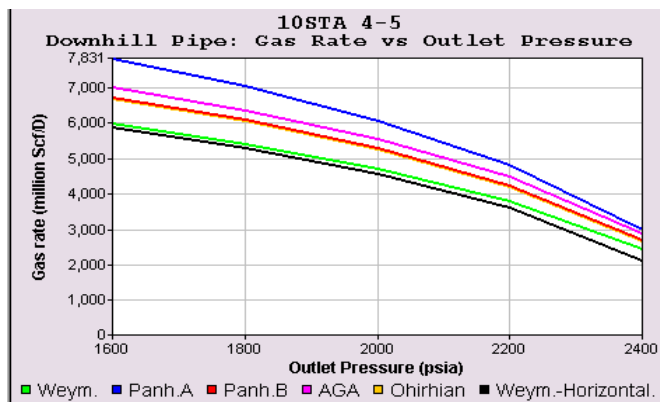
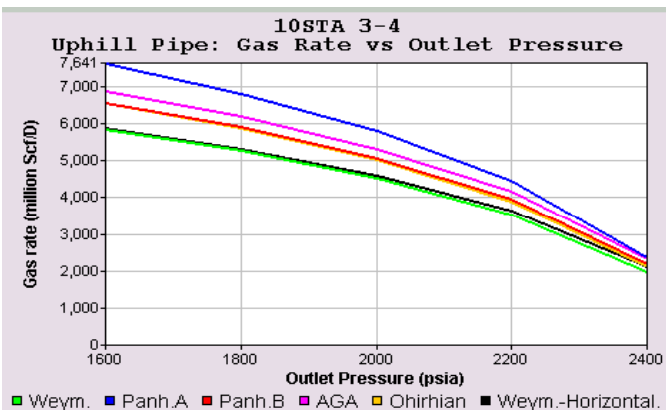
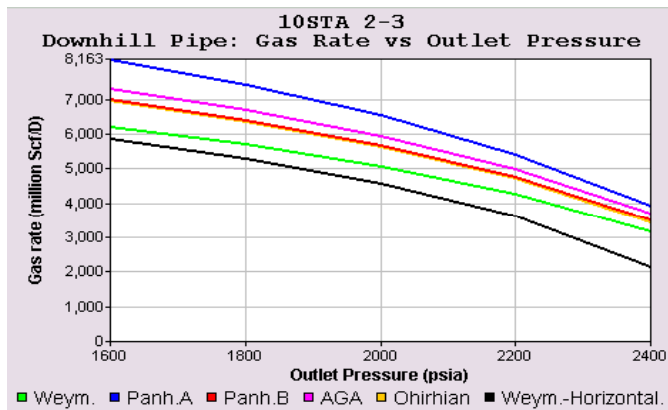
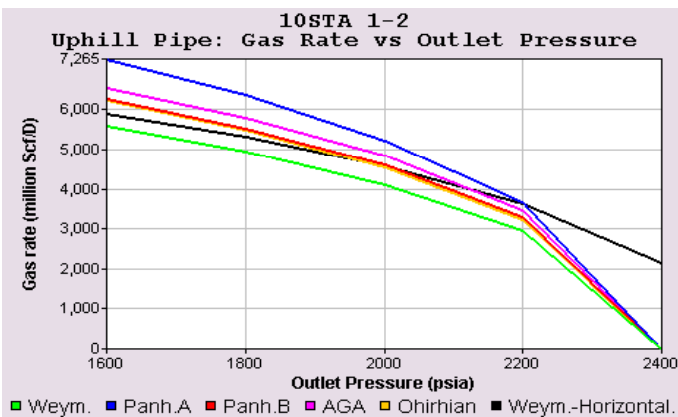
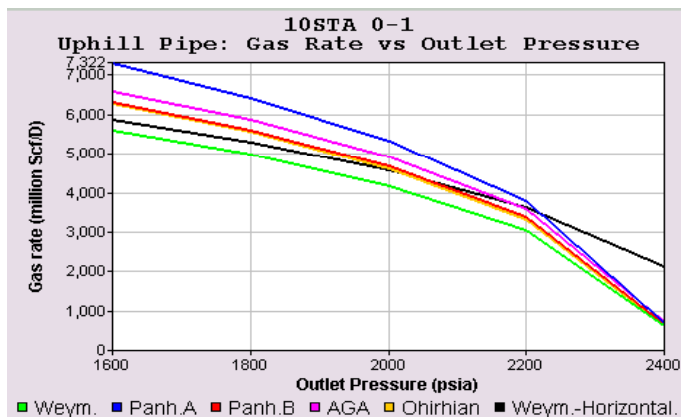
end pressure  
(P 2)

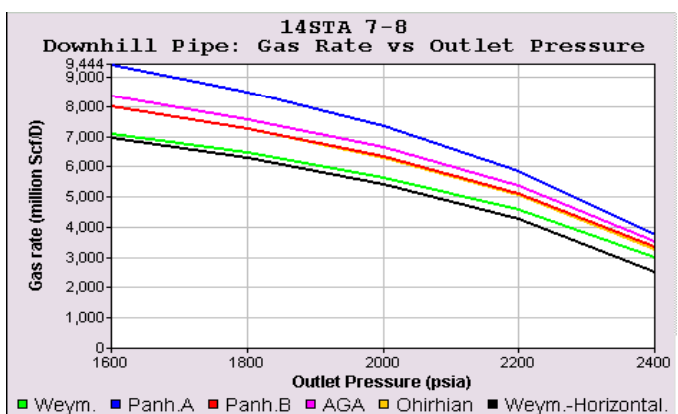
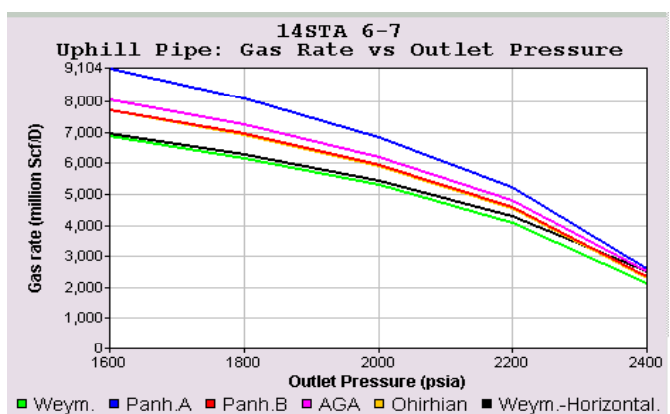
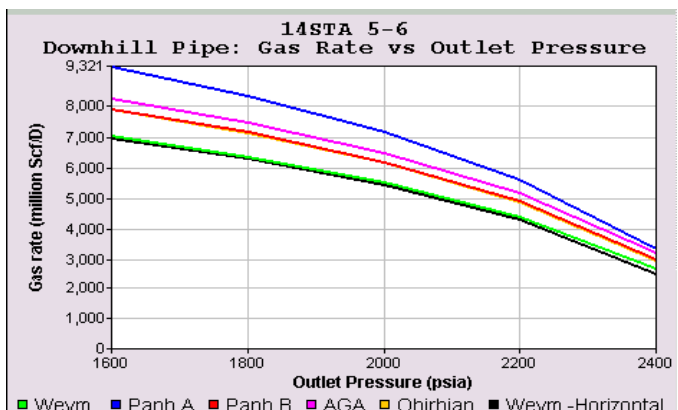
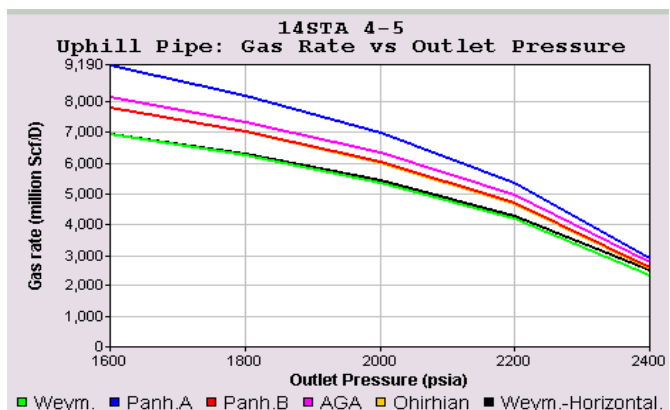
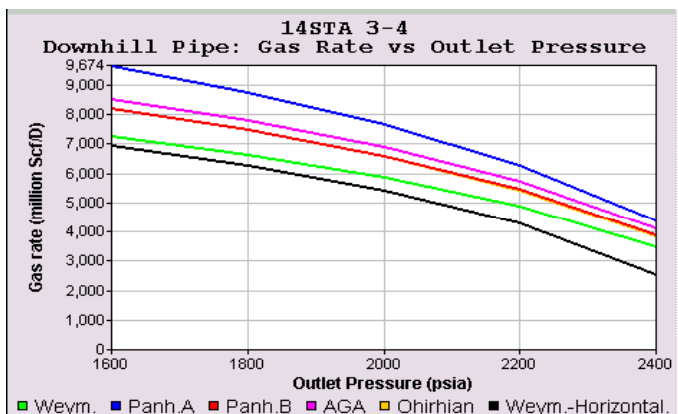
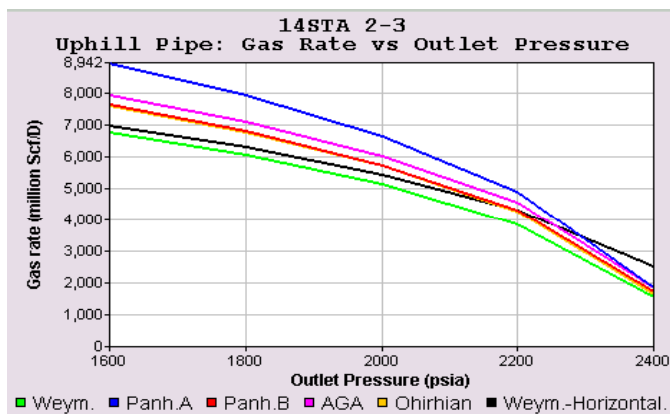
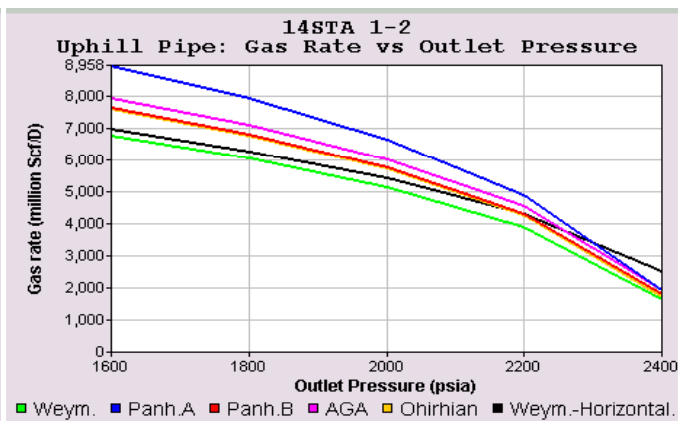
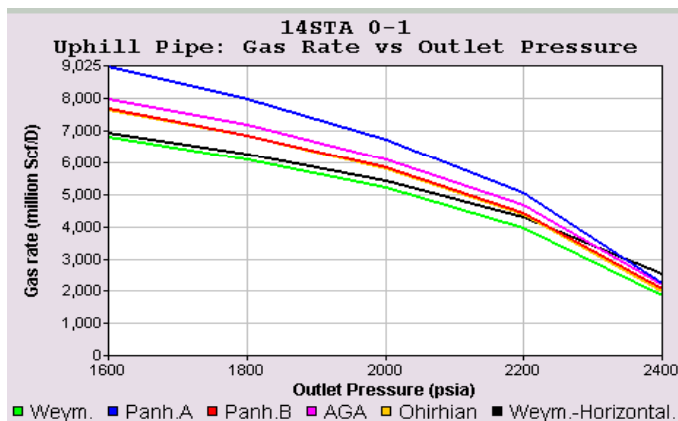
up hill & dn hill = slope flow path

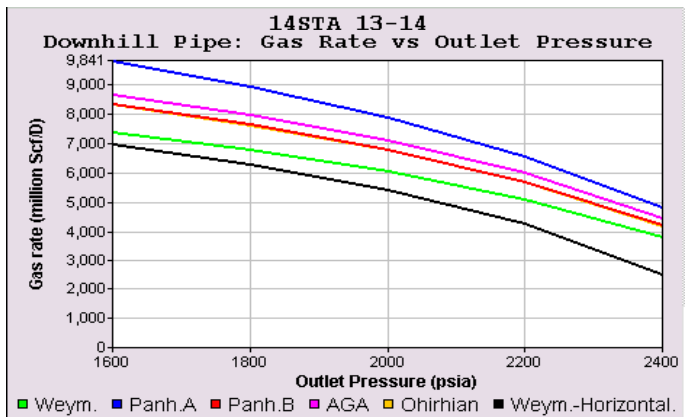
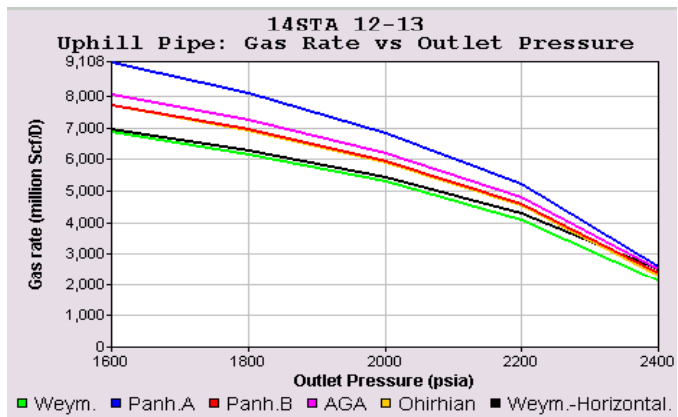
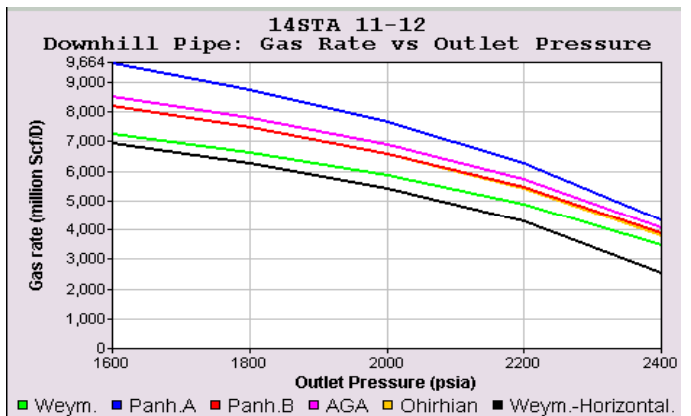
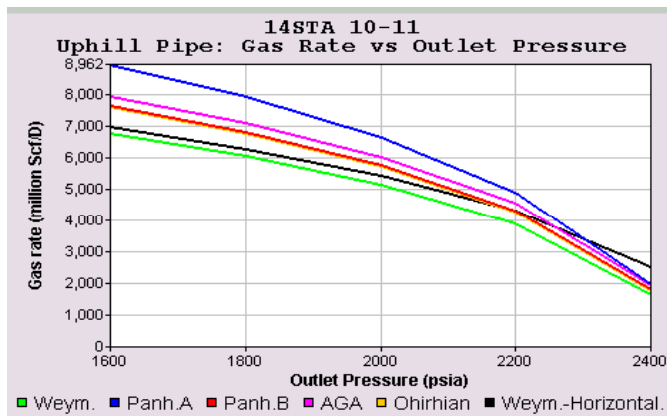
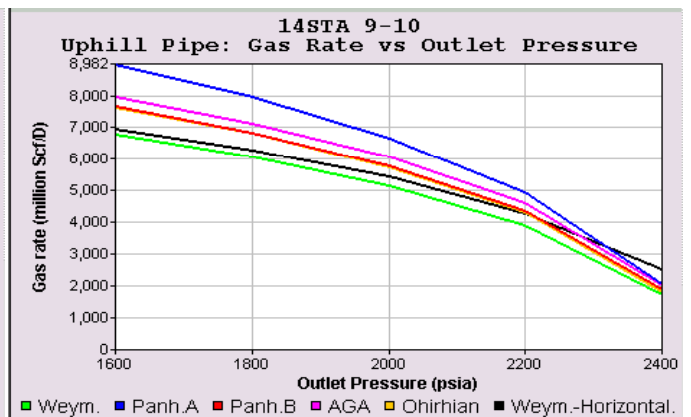
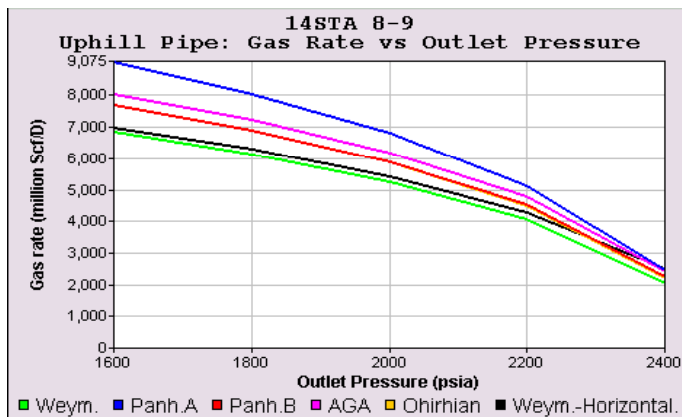
horiz. = flat flow path

Ff = calculated friction factor









10EE6	=	Bcf / yr
4,000		1,460,000,000
5,000		1,825,000,000
6,000		2,190,000,000
7,000		2,555,000,000
8,000		2,920,000,000
9,000		3,285,000,000

scf / D

10EE6	=	Bcf / yr
4,000		1,460,000
5,000		1,825,000
6,000		2,190,000
7,000		2,555,000
8,000		2,920,000
9,000		3,285,000

scf / D

4,500,000,000	4.5 billion cf/yr
12,328,767	12 million cf/day

4,500,000,000	4.5 bil cf/day
1,642,500,000,000	

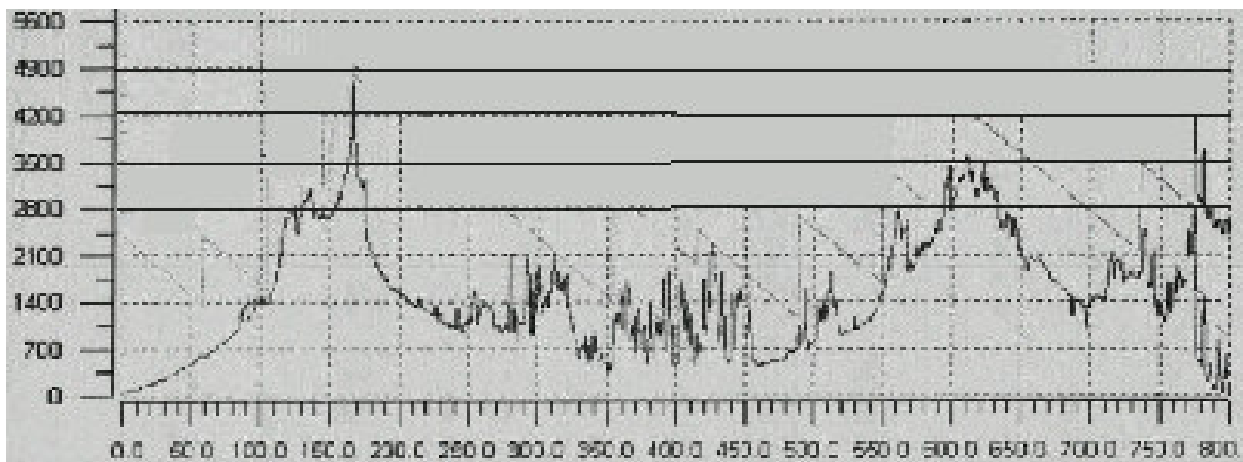
1.E+00 one  
 1.E+01 ten  
 1.E+02 hundred  
 1.E+03 thous  
 1.E+04 ten thous  
 1.E+05 hundred thou  
 1.E+06 million  
 1.E+07 ten mill  
 1.E+08 hundred mill  
 1.E+09 bill  
 1.E+10 ten bil  
 1E+11 hundred bill  
 1E+12 trill  
 1E+13 ten trill  
 1E+14 hundred trill  
 1E+15  
 1E+16  
 1E+17

# Compressor Stations @ 80 mile separation

CS #	begin M.P. no.	end M.P. no.	begin elev	end elev	elev change
1	0	80	50	1400	1,350
2	80	160	1400	2950	1,550
3	160	240	2950	1200	-1,750
4	240	320	1200	1400	200
5	320	400	1400	900	-500
6	400	480	900	700	-200
7	480	560	700	2100	1,400
8	560	640	2100	2650	550
9	640	720	2650	2020	-630
10	720	800	2020	100	-1,920

## 10 Stations

20% pressure drop between stations  
 $2500 \times 0.80 = 2000$  section end pressure

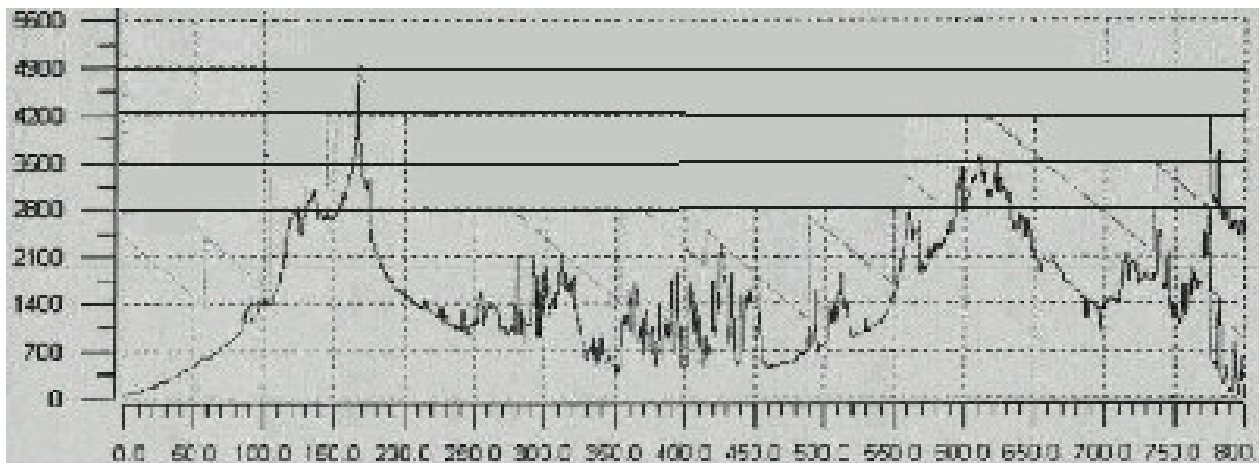


Compressor Stations @ 57 mile separation

CS #	begin M.P. no.	end M.P. no.	begin elev	end elev	elev change
1	0	57	50	700	650
2	57	114	700	1550	850
3	114	171	1550	2450	900
4	171	228	2450	1100	-1350
5	228	285	1100	1250	150
6	285	342	1250	1000	-250
7	342	399	1000	1410	410
8	399	456	1410	780	-630
9	456	513	780	1280	500
10	513	570	1280	2060	780
11	570	627	2060	2900	840
12	627	684	2900	1580	-1320
13	684	741	1580	1980	400
14	741	798	1980	100	-1880

14 Stations

20% pressure drop between stations  
 $2500 \times 0.80 = 2000$  section end pressure





Engineering Construction General Company




## TEAMING AGREEMENT

The ZPEB International and the Little Susitna Construction Company of Alaska hereby form a teaming agreement to produce an application for a license to build a gas pipeline under the Alaska Gas line Inducement Act. The ZPEB International agrees to act as a sub-consultant of the Little Susitna Construction Company to provide information and support for the application process, and the Little Susitna Construction Company agrees to produce an appropriate application for the license to build the AGIA pipeline.

This Agreement is valid for 2 years from the date of undersigning.

After getting the license, ZPEB International and Little Susitna Construction Company of Alaska will sign a new agreement to perform the project.

  
Title: Acting General Manager of  
ZPEB International

  
Title: President of Little Susitna  
Construction Co.

Date: 2007-10-24

Date: Oct 24, 2007



中原石油勘探局工程建设总公司

Engineering Construction General Company of ZPEB

地址：河南省濮阳市大庆路 122 号

Add: No.122 Daqing Road Puyang City Henan Province China

Fax No: 0393—4492718

Tel. No: 0393—4826413

## LEETER

发往： To：	Little Susitna Construction Company	编号： Ref.No：	ZECGC/L/2007/116		
收件人： Attn：	Dominic Lee P.E.	发自： From：	ZECGC		
抄送： Cc：		日期： Date：	2007.11.13	页数： Page No：	1

**Subject : LETTER OF INTENT**

Dear Sir(s),

Thank you for your letter dated Nov 8,2007.

We are hereby confirmed that we are intended to procure an estimated 4BCF/D natural gas from the pipeline project of Alaska state after it is converted to liquid natural gas if the price can be worked out satisfactorily,

Sincerely yours

Hu PeiHai

Vice General Manager

---

贵方收到传真，若发现页数不全、内容不清，请及时与我方联系  
Please contact us if you find the document not clear or any other problems

CORPORATE CERTIFICATION

STATE OF ALASKA )  
 )  
THIRD JUDICIAL DISTRICT ) ss:  
 )  
MUNICIPALITY OF ANCHORAGE )

THIS IS TO CERTIFY that I, Freddie Sue Lee, am Secretary of Little Susitna Construction Company corporation and establish that Dominic S.F. Lee, President of Little Susitna Construction Company, Inc., has full authority to enter into any business relationship in order to pursue licenses or contracts to perform construction related activities.

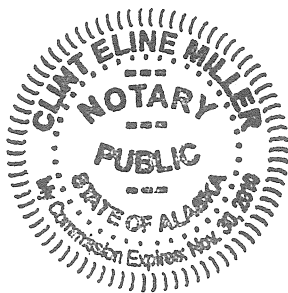
I, Freddie Sue Lee, as Secretary of the Little Susitna Construction Company, affirm that Dominic S.F. Lee is the President of the corporation, and as such, has full authority to apply for the AGIA Gasline Construction license, and he is authorized by the Board of Directors to sign the contract with full authority bind the corporation and that the seal affixed is the corporate seal of said corporation.

Dated this 21<sup>st</sup> day of November, 2007 at Anchorage, Alaska.

*Freddie Sue Lee*

Freddie Sue Lee, Corporate Secretary

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year in this certificate first above written.



A handwritten signature of the Notary Public, consisting of a series of loops and a horizontal line.

Notary Public in and for the State of Alaska  
My Commission Expires: 11-30-2010

Alaska Department of Commerce, Community, and Economic Development

Division of Corporations, Business and Professional Licensing

P.O. Box 110806 Juneau Alaska 99811-0806

This is to certify that

**LITTLE SUSITNA CONSTRUCTION CO., INC**

821 N STREET SUITE 207, ANCHORAGE AK 99501

owned by

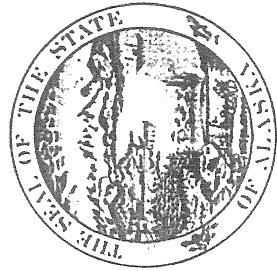
**LITTLE SUSITNA CONSTRUCTION CO., INC.**

is licensed by the department to conduct business for the period

December 29, 2006 through December 31, 2007

for the following line of business

23 - Construction



This license shall not be taken as permission to do business in the state without having complied with the other requirements of the laws of the State or of the United States.

This license must be posted in a conspicuous place at the business location. It is not transferable or assignable.

*Emil Notti*  
Commissioner

**Alaska Department of Commerce, Community, and Economic Development**

Division of Corporations, Business and Professional Licensing

P.O. Box 110806 Juneau Alaska 99811-0806

This is to certify that

**LITTLE SUSITNA CONSTRUCTION**

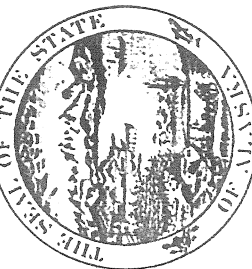
821 N STREET, SUITE 207, ANCHORAGE AK 99501

owned by

**LITTLE SUSITNA CONST**

is licensed by the department to conduct business for the period  
December 29, 2006 through December 31, 2007  
for the following line of business

54 - Professional, Scientific and Technical Services



This license shall not be taken as permission to do business in the state without having complied with the other requirements of the laws of the State or of the United States.

This license must be posted in a conspicuous place at the business location.  
It is not transferable or assignable.

**Emil Notti**  
**Commissioner**

No. 584

Effective: 02/21/2006

Expires: 12/31/2007

# STATE OF ALASKA

DEPARTMENT OF COMMUNITY & ECONOMIC DEVELOPMENT

Division of Corporations, Business and Professional Licensing

P.O. Box 110806, Juneau, Alaska 99811-0806

## BOARD OF ARCHITECTS, ENGINEERS and LAND SURVEYORS

Certifies that

**LITTLE SUSITNA CONSTRUCTION COMPANY, INC.**

IS AN AUTHORIZED

**CORPORATION**

ARCHITECTURE: KIM # 3765; ENGINEERING: CIVIL: MANYOKY #8467; ,  
ELECTRICAL: LEE #4499; AND MECHANICAL: LEE #4498

Commissioner: William C. Noll

No. 8966

Effective: 12/29/2006

Expires: 12/31/2008

# STATE OF ALASKA

DEPARTMENT OF COMMERCE, COMMUNITY & ECONOMIC DEVELOPMENT

Division of Corporations, Business and Professional Licensing

P.O. Box 110806, Juneau, Alaska 99811-0806

Division of Corporations, Business and Professional Licensing

Certifies that

**LITTLE SUSITNA CONSTRUCTION CO INC**

Is A Registered

**General Contractor-Excludes Residential**

Commissioner: Emil Notti

ARTICLES OF INCORPORATION  
OF

FILED FOR RECORD  
STATE OF ALASKA  
SEP 06 1984

LITTLE SUSITNA CONSTRUCTION COMPANY, INC. DEPARTMENT OF COMMERCE  
& ECONOMIC DEVELOPMENT

KNOW ALL MEN BY THESE PRESENTS:

That I, the undersigned natural person of the age of nineteen (19) years or more, a citizen of the State of Alaska, acting as incorporator of a corporation under the Alaska Business Corporation Act, do hereby adopt the following Articles of Incorporation for such corporation:

ARTICLE I

The name of the Corporation is:

LITTLE SUSITNA CONSTRUCTION COMPANY, INC.

ARTICLE II

The period of its duration is perpetual.

ARTICLE III

The purpose or purposes for which the corporation is organized are:

To carry on and conduct a general construction business including designing, constructing, enlarging, extending, repairing, completing, removing, or otherwise engaging in any work on commercial or industrial structures, using any building materials and techniques now employed or to be developed; to make, execute, and receive contracts therefor or relating thereto or connected therewith; to manufacture or otherwise acquire and to furnish all building and other tools and

equipment connected therewith or required therefor; to manufacture, produce, adapt, and prepare, and deal in or with any materials, articles, or things incidental to, or required for, or useful in connection with, any of such activities; and generally to carry on any other business which can be advantageously pursued in conjunction with or incidental to any of the above purposes.

To do any and all things herein set forth, and in addition, such other acts and things as are necessary or convenient to the attainment of the purposes of this corporation, or any of them, to the same extent as natural persons lawfully might or could do, in any part of the world, insofar as such acts are permitted to be done by a corporation organized under the Alaska Business Corporation Act.

#### ARTICLE IV

The aggregate number of shares which this corporation shall have authority to issue shall be NINE THOUSAND NINE HUNDRED NINETY-NINE (9,999) shares (common, non-assessable) at no par value.

#### ARTICLE V

The registered office of this corporation is:

SRA Box 924  
Anchorage, Alaska 99502

and the Registered Agent at that address is:

Dominic S. F. Lee

## ARTICLE VI

The number of directors shall not be less than the number of stockholders unless there are three or more stockholders. In that event, there shall be at least three directors, or more, the exact number to be fixed from time to time by the Board of Directors by resolution. The name and address of the initial directors who shall serve as directors until the first annual meeting of shareholders, or until their successors are elected and qualified, are as follows:

Dominic S. F. Lee  
SRA Box 924  
Anchorage, Alaska 99502

Jan Endsley  
811 "N" Street  
Anchorage, Alaska 99501

The name and address of the incorporator is as follows:

Dominic S. F. Lee  
SRA Box 924  
Anchorage, Alaska 99502

## ARTICLE VII

No holder of any stock of the corporation shall be entitled, as a matter of right, to purchase, subscribe for or otherwise acquire any new or additional shares of stock in the corporation, of any class, or any options or warrants to purchase, subscribe for or otherwise acquire any new or additional shares, or any shares, bonds, notes, debentures

or other securities convertible into or carrying options or warrants to purchase, subscribe for or otherwise acquire any such new or additional shares.

ARTICLE VIII

The corporation shall not have as an affiliate any person who is a nonresident alien, or a corporation whose place of incorporation is outside the United States.

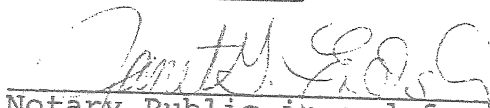
IN WITNESS WHEREOF, I have hereunto set my hand this 31st day of AUGUST, 1984.

  
DOMINIC S. F. LEE

STATE OF ALASKA                     )  
  ) ss.  
THIRD JUDICIAL DISTRICT        )

THIS IS TO CERTIFY that before me, the undersigned Notary Public in and for the State of Alaska, duly sworn and commissioned as such, personally appeared DOMINIC S. F. LEE, who, being by me first duly sworn, declared that he is the person who signed the foregoing ARTICLES OF INCORPORATION as incorporator, and that the statements therein contained are true.

WITNESS my hand and notarial seal at Anchorage, Alaska, this 31st day of AUGUST, 1984.

  
Notary Public in and for the  
State of Alaska  
My Commission Expires: 1/12/87

BY-LAWS

OF

The Little Susitna Construction Company, Inc.  
821 N Street, Suite 207, Anchorage, AK.

ARTICLE I - OFFICES

The principal office of the corporation in the State of Alaska shall be located in the 821 N Street of Anchorage, Alaska. The corporation may have such other offices, either within or without the State of incorporation as the board of directors may designate or as the business of the corporation may from time to time require.

ARTICLE II - STOCKHOLDERS

1. ANNUAL MEETING.

The annual meeting of the stockholders shall be held on the 1 day of Feb. in each year, beginning with the year 19 85 at the hour 10 o'clock A.M., for the purpose of electing directors and for the transaction of such other business as may come before the meeting. If the day fixed for the annual meeting shall be a legal holiday such meeting shall be held on the next succeeding business day.

2. SPECIAL MEETINGS.

Special meetings of the stockholders, for any purpose or purposes, unless otherwise prescribed by statute, may be called by the president or by the directors, and shall be called by the president at the request of the holders of not less than Fifty per cent of all the outstanding shares of the corporation entitled to vote at the meeting.

3. PLACE OF MEETING.

The directors may designate any place, either within or without the State unless otherwise prescribed by statute, as the place of meeting for any annual meeting or for any special meeting called by the directors. A waiver of notice signed by all stockholders entitled to vote at a meeting may designate

any place, either within or without the state unless otherwise prescribed by statute, as the place for holding such meeting. If no designation is made, or if a special meeting be otherwise called, the place of meeting shall be the principal office of the corporation.

#### 4. NOTICE OF MEETING.

Written or printed notice stating the place, day and hour of the meeting and, in case of a special meeting, the purpose or purposes for which the meeting is called, shall be delivered not less than <sup>ten</sup> one nor more than <sup>ten</sup> days before the date of the meeting, either personally or by mail, by or at the direction of the president, or the secretary, or the officer or persons calling the meeting, to each stockholder of record entitled to vote at such meeting. If mailed, such notice shall be deemed to be delivered when deposited in the United States mail, addressed to the stockholder at his address as it appears on the stock transfer books of the corporation, with postage thereon prepaid.

#### 5. CLOSING OF TRANSFER BOOKS OR FIXING OF RECORD DATE.

For the purpose of determining stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, or stockholders entitled to receive payment of any dividend, or in order to make a determination of stockholders for any other proper purpose, the directors of the corporation may provide that the stock transfer books shall be closed for a stated period but not to exceed, in any case, thirty days. If the stock transfer books shall be closed for the purpose of determining stockholders entitled to notice of or to vote at a meeting of stockholders, such books shall be closed for at least <sup>thirty</sup> days immediately preceding such meeting. In lieu of closing the stock transfer books, the directors may fix in advance a date as the record date for any such determination of stockholders, such date in any case to be not more than <sup>ten</sup> days and, in case of a meeting of stockholders, not less than <sup>thirty</sup> days prior to the date on which the particular action requiring such determination of stockholders is to be taken. If the stock transfer books are not closed and no record date is fixed for the determination of stockholders entitled to notice of or to vote at a meeting of stockholders, or stockholders entitled to receive payment of a dividend, the date on which notice of the meeting is mailed or the date on which the resolution of the directors declaring such dividend is adopted, as the case may be, shall be the record date for such determination of stockholders. When a determination of stockholders entitled to vote at any meeting of stockholders

has been made as provided in this section, such determination shall apply to any adjournment thereof.

#### 6. VOTING LISTS.

The officer or agent having charge of the stock transfer books for shares of the corporation shall make, at least <sup>thirty</sup> days before each meeting of stockholders, a complete list of the stockholders entitled to vote at such meeting, or any adjournment thereof, arranged in alphabetical order, with the address of and the number of shares held by each, which list, for a period of <sup>thirty</sup> days prior to such meeting, shall be kept on file at the principal office of the corporation and shall be subject to inspection by any stockholder at any time during usual business hours. Such list shall also be produced and kept open at the time and place of the meeting and shall be subject to the inspection of any stockholder during the whole time of the meeting. The original stock transfer book shall be prima facie evidence as to who are the stockholders entitled to examine such list or transfer books or to vote at the meeting of stockholders.

#### 7. QUORUM.

At any meeting of stockholders with 51% percent of the outstanding shares of the corporation entitled to vote, represented in person or by proxy, shall constitute a quorum at a meeting of stockholders. If less than said number of the outstanding shares are represented at a meeting, a majority of the shares so represented may adjourn the meeting from time to time without further notice. At such adjourned meeting at which a quorum shall be present or represented, any business may be transacted which might have been transacted at the meeting as originally notified. The stockholders present at a duly organized meeting may continue to transact business until adjournment, notwithstanding the withdrawal of enough stockholders to leave less than a quorum.

#### 8. PROXIES.

At all meetings of stockholders, a stockholder may vote by proxy executed in writing by the stockholder or by his duly authorized attorney in fact. Such proxy shall be filed with the secretary of the corporation before or at the time of the meeting.

#### 9. VOTING.

Each stockholder entitled to vote in accordance with the terms and provisions of the certificate of incorporation and these by-laws shall be entitled to vote, "One vote per share" and voting shall be proportional to stock ownership, voting can be in person or by

proxy, for each share of stock entitled to vote held by such stockholders. Upon the demand of any stockholder, the vote for directors and upon any question before the meeting shall be by ballot. All elections for directors shall be decided by plurality vote; all other questions shall be decided by majority vote except as otherwise provided by the Certificate of Incorporation or the laws of this State.

10. ORDER OF BUSINESS.

The order of business at all meetings of the stockholders, shall be as follows:

1. Roll Call.
2. Proof of notice of meeting or waiver of notice.
3. Reading of minutes of preceding meeting.
4. Reports of Officers.
5. Reports of Committees.
6. Election of Directors.
7. Unfinished Business.
8. New Business.

11. INFORMAL ACTION BY STOCKHOLDERS.

Unless otherwise provided by law, any action required to be taken at a meeting of the shareholders, or any other action which may be taken at a meeting of the shareholders, may be taken without a meeting if a consent in writing, setting forth the action so taken, shall be signed by all of the shareholders entitled to vote with respect to the subject matter thereof.

### ARTICLE III - BOARD OF DIRECTORS

#### 1. GENERAL POWERS.

The business and affairs of the corporation shall be managed by its board of directors. The directors shall in all cases act as a board, and they may adopt such rules and regulations for the conduct of their meetings and the management of the corporation, as they may deem proper, not inconsistent with these by-laws and the laws of this State.

#### 2. NUMBER, TENURE AND QUALIFICATIONS.

The number of directors of the corporation shall be TWO (2). Each director shall hold office until the next annual meeting of stockholders and until his successor shall have been elected and qualified.

#### 3. REGULAR MEETINGS.

A regular meeting of the directors, shall be held without other notice than this by-law immediately after, and at the same place as, the annual meeting of stockholders. The directors may provide, by resolution, the time and place for the holding of additional regular meetings without other notice than such resolution.

#### 4. SPECIAL MEETINGS.

Special meetings of the directors may be called by or at the request of the president or any two directors. The person or persons authorized to call special meetings of the directors may fix the place for holding any special meeting of the directors called by them.

#### 5. NOTICE.

Notice of any special meeting shall be given at least <sup>one</sup> days previously thereto by written notice delivered personally, or by telegram or mailed to each director at his business address. If mailed, such notice shall be deemed to be delivered when deposited in the United States mail so addressed, with postage thereon prepaid. If notice be given by telegram, such notice shall be deemed to be delivered when the telegram is delivered to the telegraph company. The attendance of a director at a meeting shall constitute a waiver of notice of such meeting, except where a director attends a meeting for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened.

6. QUORUM.

A quorum shall consist of the majority of the stock outstanding and a majority of the stock outstanding shall be necessary to decide any question at any meeting.

7. MANNER OF ACTING.

The act of majority of the directors present at a meeting at which a quorum is present shall be the act of the directors. The voting shall be proportional to stock ownership.

Newly created directorships resulting from an increase in the number of directors and vacancies occurring in the board for any reason except the removal of directors without cause may be filled by a vote of a majority of the directors then in office, although less than a quorum exists. Vacancies occurring by reason of the removal of directors without cause shall be filled by vote of the stockholders. A director elected to fill a vacancy caused by resignation, death or removal shall be elected to hold office for the unexpired term of his predecessor.

9. REMOVAL OF DIRECTORS.

Any or all of the directors may be removed for cause by vote of the stockholders or by action of the board. Directors may be removed without cause only by vote of the stockholders.

10. RESIGNATION.

A director may resign at any time by giving written notice to the board, the president or the secretary of the corporation. Unless otherwise specified in the notice, the resignation shall take effect upon receipt thereof by the board or such officer, and the acceptance of the resignation shall not be necessary to make it effective.

11. COMPENSATION.

No compensation shall be paid to directors, as such, for their services, but by resolution of the board a fixed sum and expenses for actual attendance at each regular or special meeting of the board may be authorized. Nothing herein contained shall be construed to preclude any director from serving the corporation in any other capacity and receiving compensation therefor.

12. PRESUMPTION OF ASSENT.

A director of the corporation who is present at a meeting of the directors at which action on any corporate matter is taken shall be presumed to have assented to the action taken unless his dissent shall be entered in the minutes of the meeting or unless he shall file his written dissent to such action with the person acting as the secretary of the meeting before the adjournment thereof or shall forward such dissent by registered mail to the secretary of the corporation immediately after the adjournment of the meeting. Such right to dissent shall not apply to a director who voted in favor of such action.

13. EXECUTIVE AND OTHER COMMITTEES.

The board, by resolution, may designate from among its members an executive committee and other committees, each consisting of three or more directors. Each such committee shall serve at the pleasure of the board.

14. The chairman shall have full control of the business and he shall involved in the day-to-day management of it.

## ARTICLE IV - OFFICERS

### 1. NUMBER.

The officers of this corporation shall be a president, secretary and any other officer which the Board of Directors may designate from time to time; and who shall be elected by the Board of Directors for the term of one year, and shall hold office until their successors are duly elected and qualified. Offices may be combined as permitted by law. The offices of president and treasurer may be held by one person. The offices of secretary and vice-president may be held by one person.

### 2. ELECTION AND TERM OF OFFICE.

The officers of the corporation to be elected by the directors shall be elected annually at the first meeting of the directors held after each annual meeting of the stockholders. Each officer shall hold office until his successor shall have been duly elected and shall have qualified or until his death or until he shall resign or shall have been removed in the manner hereinafter provided.

### 3. REMOVAL.

Any officer or agent elected or appointed by the directors may be removed by the directors whenever in their judgment the best interests of the corporation would be served thereby, but such removal shall be without prejudice to the contract rights, if any, of the person so removed.

### 4. VACANCIES.

A vacancy in any office because of death, resignation, removal, disqualification or otherwise, may be filled by the directors for the unexpired portion of the term.

### 5. PRESIDENT.

The president shall be the principal executive officer of the corporation and, subject to the control of the directors, shall in general supervise and control all of the business and affairs of the corporation. He shall, when present, preside at all meetings of the stockholders and of the directors. He may sign, with the secretary or any other proper officer of the corporation thereunto authorized by the directors, certificates for shares of the corporation, any deeds, mortgages, bonds, contracts, or other instruments which the directors have authorized to be executed, except in cases where the signing and execution thereof shall be expressly delegated by the directors or by these by-laws to some other officer or agent of the corporation, or shall be required by law to be otherwise signed or executed; and in general shall

perform all duties incident to the office of president and such other duties as may be prescribed by the directors from time to time.

6. VICE-PRESIDENT. The president can serve as vice-president of the corporation.

In the absence of the president or in event of his death, inability or refusal to act, the vice-president shall perform the duties of the president, and when so acting, shall have all the powers of and be subject to all the restrictions upon the president. The vice-president shall perform such other duties as from time to time may be assigned to him by the President or by the directors.

7. SECRETARY. The president can serve as secretary of the corporation.

The secretary shall keep the minutes of the stockholders' and of the directors' meetings in one or more books provided for that purpose, see that all notices are duly given in accordance with the provisions of these by-laws or as required, be custodian of the corporate records and of the seal of the corporation and keep a register of the post office address of each stockholder which shall be furnished to the secretary by such stockholder, have general charge of the stock transfer books of the corporation and in general perform all duties incident to the office of secretary and such other duties as from time to time may be assigned to him by the president or by the directors.

8. TREASURER. The president can serve as treasurer of the corporation.

If required by the directors, the treasurer shall give a bond for the faithful discharge of his duties in such sum and with such surety or sureties as the directors shall determine. He shall have charge and custody of and be responsible for all funds and securities of the corporation; receive and give receipts for moneys due and payable to the corporation from any source whatsoever, and deposit all such moneys in the name of the corporation in such banks, trust companies or other depositories as shall be selected in accordance with these by-laws and in general perform all of the duties incident to the office of treasurer and such other duties as from time to time may be assigned to him by the president or by the directors.

9. SALARIES.

The salaries of the officers shall be fixed from time to time by the directors and no officer shall be prevented from receiving such salary by reason of the fact that he is also a director of the corporation.

## ARTICLE V - CONTRACTS, LOANS, CHECKS AND DEPOSITS

### 1. CONTRACTS.

The directors may authorize any officer or officers, agent or agents, to enter into any contract or execute and deliver any instrument in the name of and on behalf of the corporation, and such authority may be general or confined to specific instances.

### 2. LOANS.

No loans shall be contracted on behalf of the corporation and no evidences of indebtedness shall be issued in its name unless authorized by a resolution of the directors. Such authority may be general or confined to specific instances.

### 3. CHECKS, DRAFTS, ETC.

All checks, drafts or other orders for the payment of money, notes or other evidences of indebtedness issued in the name of the corporation, shall be signed by such officer or officers, agent or agents of the corporation and in such manner as shall from time to time be determined by resolution of the directors.

### 4. DEPOSITS.

All funds of the corporation not otherwise employed shall be deposited from time to time to the credit of the corporation in such banks, trust companies or other depositaries as the directors may select.

## ARTICLE VI - CERTIFICATES FOR SHARES AND THEIR TRANSFER

### 1. CERTIFICATES FOR SHARES.

Certificates representing shares of the corporation shall be in such form as shall be determined by the directors. Such certificates shall be signed by the president and by the secretary or by such other officers authorized by law and by the directors. All certificates for shares shall be consecutively numbered or otherwise identified. The name and address of the stockholders, the number of shares and date of issue, shall be entered on the stock transfer books of the corporation. All certificates surrendered to the corporation for transfer shall be canceled and no new certificate shall be issued until the

former certificate for a like number of shares shall have been surrendered and canceled, except that in case of a lost, destroyed or mutilated certificate a new one may be issued therefor upon such terms and indemnity to the corporation as the directors may prescribe.

## 2. TRANSFERS OF SHARES.

(a) Upon surrender to the corporation or the transfer agent of the corporation of a certificate for shares duly endorsed or accompanied by proper evidence of succession, assignment or authority to transfer, it shall be the duty of the corporation to issue a new certificate to the person entitled thereto, and cancel the old certificate; every such transfer shall be entered on the transfer book of the corporation which shall be kept at its principal office.

(b) The corporation shall be entitled to treat the holder of record of any share as the holder in fact thereof, and, accordingly, shall not be bound to recognize any equitable or other claim to or interest in such share on the part of any other person whether or not it shall have express or other notice thereof, except as expressly provided by the laws of this state.

## ARTICLE VII - FISCAL YEAR

The fiscal year of the corporation shall begin on the  
1 day of February in each year.

## ARTICLE VIII - DIVIDENDS

The directors may from time to time declare, and the corporation may pay, dividends on its outstanding shares in the manner and upon the terms and conditions provided by law.

## ARTICLE IX - SEAL

The directors shall provide a corporate seal which shall be circular in form and shall have inscribed thereon the name of the corporation, the state of incorporation, year of incorporation and the words, "Corporate Seal".

#### ARTICLE X - WAIVER OF NOTICE

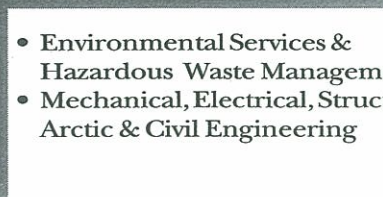
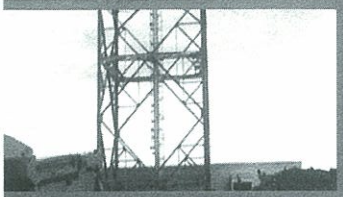
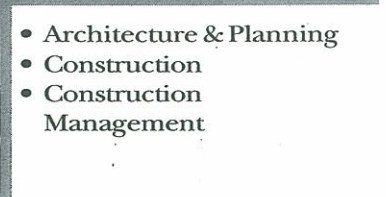
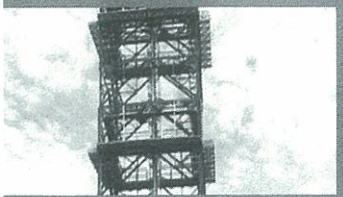
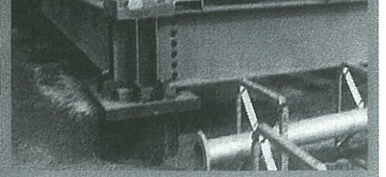
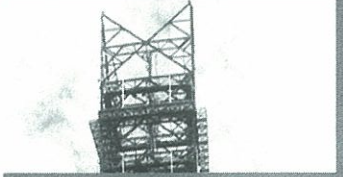
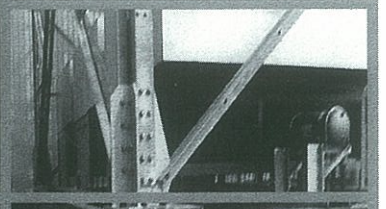
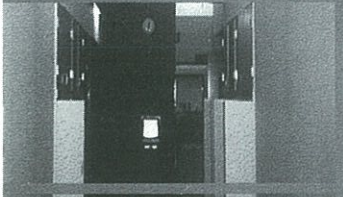
Unless otherwise provided by law, whenever any notice is required to be given to any stockholder or director of the corporation under the provisions of these by-laws or under the provisions of the articles of incorporation, a waiver thereof in writing, signed by the person or persons entitled to such notice, whether before or after the time stated therein, shall be deemed equivalent to the giving of such notice.

#### ARTICLE XI - AMENDMENTS

These by-laws may be altered, amended or repealed and new by-laws may be adopted by a vote of the stockholders representing a majority of all the shares issued and outstanding, at any annual stockholders' meeting or at any special stockholders' meeting when the proposed amendment has been set out in the notice of such meeting.

# LSCC

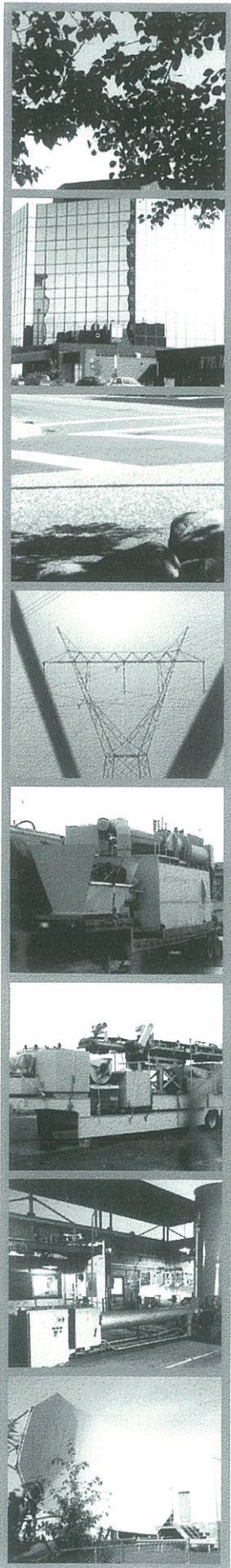
Little Susitna Construction Company



- Electric Power System Engineering & Power Plant Contractor
- Oil Field On Shore/ Off Shore Drilling & Petroleum Facilities Services

- Architecture & Planning
- Construction
- Construction Management

- Environmental Services & Hazardous Waste Management
- Mechanical, Electrical, Structural, Arctic & Civil Engineering



## A Full-Service Design & Construction Company

Little Susitna Construction Company has been growing with Alaska since 1980. As a full-service architectural/engineering/construction firm, LSCC has learned to handle the many climates and environments Alaska offers. Our design experience in Alaska, using Arctic and Sub-Arctic engineering is second to none. We have completed more than 600 projects in over 90 communities throughout the state. From Ketchikan to Prudhoe Bay, Adak to Nome, our name is known as one of Alaska's top full-service design and construction companies.

## Architecture & Planning

Planning has been defined as that which precedes everything else and affects all that follows. Planning ensures that our clients get what they need and that the completed project will have an extended useful life. Today, the successful completion of any project has become a very complicated task. It requires the combined services of many specialists who are experts in such areas as finance, land acquisition, architecture, engineering, planning, construction, and maintenance. In all of this, efficient design solutions are essential to the success of the project. Licensed in 19 states, our design team draws from its vast array of experience and talent to provide the client with the most cost-effective, beautiful, and functional structure possible.

## Multi-Discipline Engineering

LSCC has licensed engineers in a wide variety of disciplines, including electrical, mechanical, civil, structural, and arctic engineering. These professionals offer a wealth of technical and practical knowledge and experience. • **Electrical Engineering** services offered include power distribution design, studies and systems, lighting design, communication systems, airport navigations aids, and audio and video system design. • **Mechanical Engineering** services include energy systems; heating, ventilating, and air conditioning; refrigeration; fire protection systems; and plumbing. • **Structural Engineering** services include industrial facilities, highway and railroad bridge design, radio and broadcast tower design, architectural building product analysis, and seismic design of structures in high seismic risk areas. • **Civil Engineering** services include site development projects, industrial complexes, universities, medical institutions, government projects, roads and parking, earth work plans, erosion control, utility plans and profiles for water, storm sewer, and gas transmission.

## Construction & Construction Management

LSCC's construction division provides the capability to handle almost any kind of project. As general contractors, we have completed over 200 projects worth more than \$10,000,000. We also specialize in construction management. Through contracts with the Coast Guard, FAA, and U.S. Army, we provide construction management all across Alaska and throughout the Pacific Rim on projects valued in the hundreds of millions of dollars.

## Environmental & Hazardous Waste Management

LSCC is licensed to provide effective hydrocarbon burn treatment of liquid and soil contaminants, as well as toxic waste sampling, testing, cleanup, packaging, manifests, labeling, transportation, and disposal. For burn treatment of contaminants, LSCC uses two models of the SUE® Burner which has been military and California DHS tested with destruction ratings of 99.99% while in compliance with clean air laws. We also specialize in nature reclamation programs to return a contaminated site to its natural condition once cleanup work is completed.

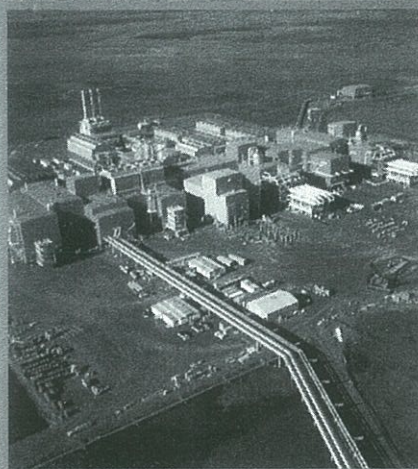
## Telecommunication Engineering Design & Installation

LSCC Engineers have a wealth of experience in Telecommunication Engineering design and Installation. They are specialized in Telephone Systems, Satellite and Ground Stations Communication, T.V. and Radio Broadcast, Cable T.V. systems, Radar and Air Traffic Control Systems. LSCC's experience includes FAA, TRACON Facility Addition, Telephone Systems using fiber-optics for Cities of Anchorage/Girdwood, Cordova, Sand Point, Mat-Su, Dillingham, Cable T.V. for Anchorage, Telecommunication Design for ARCO, Alaska State Public Broadcasting System and Airport Navigational AID Design for 36 Alaska state owned airports.



## Electric Power System Engineering and Power Plant Contractor

LSCC is a leading supplier of electric power supply consulting engineering, a focus of our professional efforts since the beginning of our firm. We can design and construct a turn-key electric power plant with oil, gas or coal-fired generating capacities, ranging from 5 megawatts to 500 megawatts. These plants will operate with high sulfur coal without emission problems and have U.S. Environmental Protection Agency approval.



## Oil Field On-Shore/Off-Shore Drilling and Petroleum Production Facilities Services

LSCC has been designing Alaska North Slope Oil Field production facilities for ARCO Alaska for years. Projects include their Production Complex, Communication Center and Tower, Main Camp Mess Hall, warehouses, offices, Medical/Dental Clinic, pump stations, utility distribution systems, recreation center and a section of Hull Road. LSCC also has oil field drilling experience in Prudhoe Bay Oil Field and Katalla Oil Field with Alaska Crude Corporation, NKG Drilling and Oil Field Service Co. We have the know-how and technology for state-of-the-art drilling for both production and exploration of oil wells.



## Aquacultural Engineering & Fish Hatchery Design

LSCC has been a pioneer in aquacultural engineering and fish hatchery design. The 6.6 million dollar Ft. Richardson Fish Hatchery in Alaska is one of the representative projects for rearing different species of salmon and trout. Our aquacultural engineer, Mr. James D. Caufield, P.E., has received the National Award by the American Consulting Engineers Council for the design of Mixsawbah Fish Hatchery for the State of Indiana. Mr. Caufield also designed projects which accommodate cold, cool and warm water species of fish: seventeen hatcheries and rearing stations at an aggregate construction cost of over \$30 million capable of producing over 300 million fish annually; four release/recapture facilities at an aggregate construction cost of \$10 million with the capability of releasing 100 million fish annually.



## Louis Berger International & Little Susitna Joint Venture

Since 1982, LSCC has had a joint venture agreement with Louis Berger International. The joint venture team has completed 13 projects with the U.S. Army Corps of Engineers and other projects in Alaska for other government agencies. Louis Berger International is one of the largest multidisciplinary consulting organizations in the world. Founded in 1940, Louis Berger Group professionals offer expertise in areas of engineering, construction management, waterfront and marine facilities, highways and bridges, transit, aviation, buildings, industrial plants, cultural resources and environmental services. Louis Berger International has a staff of 1,600 professionals with offices and projects in the United States and 75 foreign countries.

**Little Susitna Construction Company, Inc.  
PAST & CURRENT CLIENTS**

**U.S. Government:**

U.S. Army, Corps of Engineers  
Alaska District  
Portland District

U.S. Army     Ft. Richardson, Alaska  
                 Ft. Wainwright, Alaska  
                 Ft. Greeley, Alaska

U.S. Air Force, Alaska District  
Elmendorf A.F.B., Alaska  
Eielson A.F.B., Alaska  
Erickson A.F.B., Alaska

U.S. Air National Guard - Kulis National Guard, Alaska  
U.S. Army National Guard, Alaska District

U.S. Navy, San Bruno, California  
U.S. Navy, Adak Naval Station, Alaska

U.S. Coast Guard, Juneau, Alaska  
U.S. Coast Guard, Kodiak Integrated Support Command, Alaska  
U.S. Coast Guard, 13<sup>th</sup> District, Seattle, Washington  
U.S. Coast Guard, New York, New York

U.S. Federal Aviation Administration (FAA)  
U.S. Fish and Wildlife, Alaska District  
U.S. National Forest, Alaska District  
U.S. National Weather Bureau, Alaska District  
U.S. Public Health Service  
U.S. Housing and Urban Development, Alaska District

**State of Alaska:**

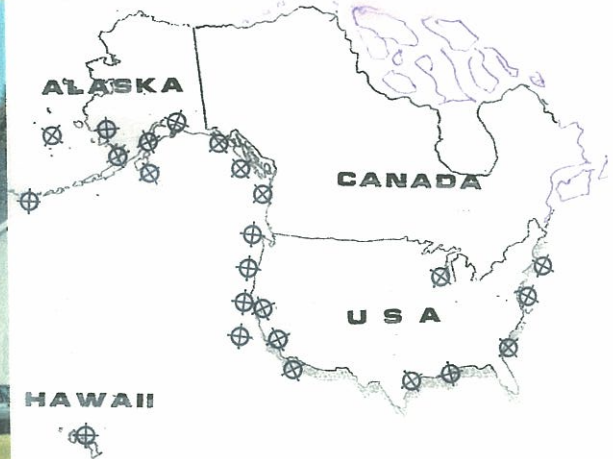
Department of Transportation and Public Facilities  
Department of Corrections  
Department of Natural Resources, Division of Parks  
Department of Military and Veterans Affairs  
Department of Fish and Game  
Alaska Housing Finance Corporation

***Little Susitna Construction Company, Inc. (Est. 1980)***  
Architects & Planners • Consulting Engineers • General Contractors  
Mechanical, Electrical, & Civil Contractors  
Construction Inspection and Management

**United States Coast Guard Inspection Services**  
Construction Cost: US \$1,500,000,000.00



Project Location: Throughout USA



Our firm has provided services under 3 construction inspection contracts with the U.S. Coast Guard 13<sup>th</sup> District, Facilities Design & Construction Center, Pacific (Seattle, WA) to perform Construction Inspection and Construction Management for an estimated \$1.5 billion of construction projects throughout the United States. Projects have been located at Honolulu, HI; Attu, St. Paul, Port Clarence, Ketchikan, Sitka, Juneau, Kodiak, AK; San Pedro, San Francisco Bay area, CA; New York City, NY; Bayonne & Cape May, NJ; Tawas, St. Ignace, MI; Charleston, SC; Oregon Coastline and Washington Coastline. Each project cost is between \$3 million to \$20 million with a total of \$1.5 billion in 11 years time (1992 - 2002). Over \$350 million is for new housing construction. Most of these project involve U.S.C.G. on-shore facilities such as hospitals, housing, mess halls, medical clinics, warehouses, lab, piers, airport runways, roads and shore facilities for the U.S.C.G. fleet and service stations.

Our resident, on-site construction manager's duties included updating of CPM schedules of the entire construction project, review of construction documents and cost estimates, inspection for conformance with contract requirements, review of contractor's schedules and programs, maintenance of project files, inspection records, testing records, and job diaries; recommending, estimating, and evaluating change orders, monitoring submittals and costs, review of contractor's payment request; analysis and recommendations related to these services; and other services required for successful administration of the project.

Work includes lead paint, toxic waste and contaminated material Treatment, Storage, and Disposal Facility (TSDF) plan and actual supervision of the transportation and disposal of these hazardous materials, air monitoring, abatement and lab testing to meet OSHA, Alaska DEC, and EPA regulations.

**Local Governments Within State of Alaska:**

City of Anchorage  
City of Bethel  
City of Cordova  
City of Dillingham  
City of Fairbanks  
City of Kenai  
City of Mentasta  
City of Valdez  
Matanuska-Susitna Borough  
Anchorage School District  
Kenai Peninsula Borough School District  
Lower Yukon School District  
Dillingham School District  
Bering Straights School District  
Chevak School District  
North Slope School District  
Fairbanks School District  
University of Alaska Fairbanks  
University of Alaska Juneau  
University of Alaska Anchorage

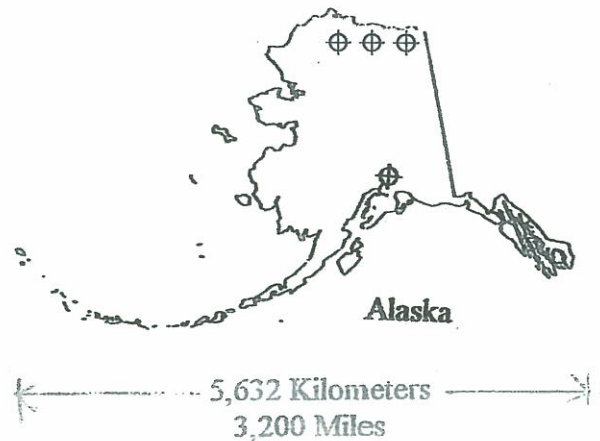
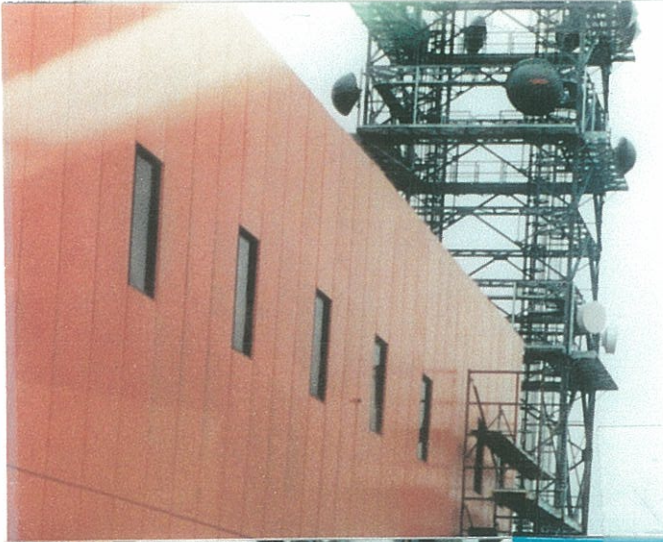
**Private Clients:**

Fred Meyers Stores  
Safeway Stores  
Dimond Center  
Marriott Hotel  
Travelodge Hotel  
Jesse Lee Children's Home  
Muldoon Community Assembly Church  
First Assembly of God Church  
DeFord Masonry  
Ginza Chinese Restaurant  
Fifth Avenue Office Development  
Ruby John Gas Station and Restaurant  
Channel 14 to 70 Cable T.V. Stations  
Channel 5 KYES T.V. Station  
Channel 7 KAKM T.V. Station  
Abraham Gallo Office Building  
Gallo's Mexican Restaurant

***Little Susitna Construction Company, Inc. (Est. 1980)***  
Architects & Planners • Consulting Engineers • General Contractors  
Mechanical, Electrical, & Civil Contractors  
Construction Inspection and Management

**ARCO North Slope Facilities**

Construction Cost: US \$340,000,000.00      Project Location: North Slope (Prudhoe Bay), Alaska



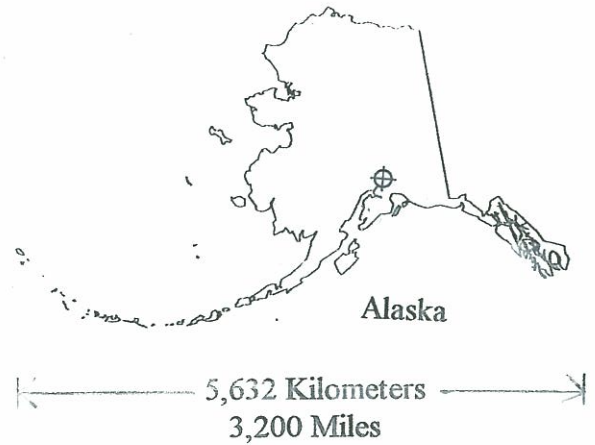
Our firm provided architectural and engineering services for Atlantic Richfield Oil Company (ARCO) on their Alaska North Slope facility for over 12 years. Projects participated in were at the Prudhoe Bay Oil Field and Kuparuk Oil Field infrastructure facility. Projects included Administration Building, Medical and Dental Clinic, Power Plant and Power Distribution, Mess Hall, Main Camp, Recreational Center, Fire Station, Warehouses, and Roads. We also provided other services such as value engineering, construction administration, inspection and testing of the facilities.

***Little Susitna Construction Company, Inc. (Est. 1980)***  
Architects & Planners • Consulting Engineers • General Contractors  
Mechanical, Electrical, & Civil Contractors  
Construction Inspection and Management



**Anchorage Marriott Hotel, Alaska**  
Construction Cost: US \$88,000,000.00

Project Location: Anchorage, Alaska



This beautiful five star hotel was completed in Mach 2000 and is one of the newest hotels built since the 1964 Good Friday earthquake. All engineering design exceeded the extra earthquake zone required by the Uniform Building Code. The hotel has 400 guest rooms, indoor swimming pool, physical fitness room, shops, four restaurants and lunge, and a large ballroom for conventions that can seat 2,500 people. Little Susitna Construction was responsible for all electrical engineering design and inspection, limited construction and project management.

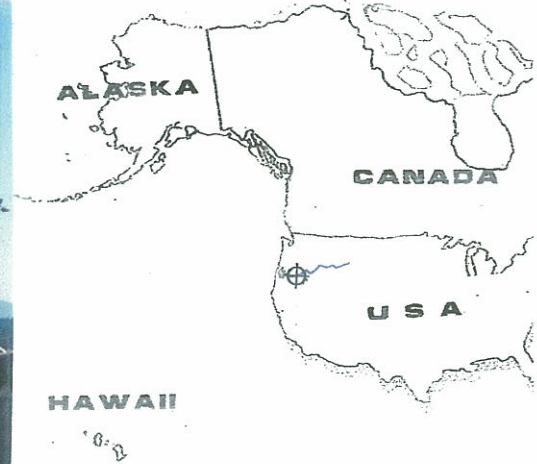
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Construction Inspection and Management



**US Army Corps  
of Engineers**

**Bonneville Dam Spillway Gate Hoists**  
Construction Cost: US \$20,000,000.00

Project Location: Bonneville, Oregon



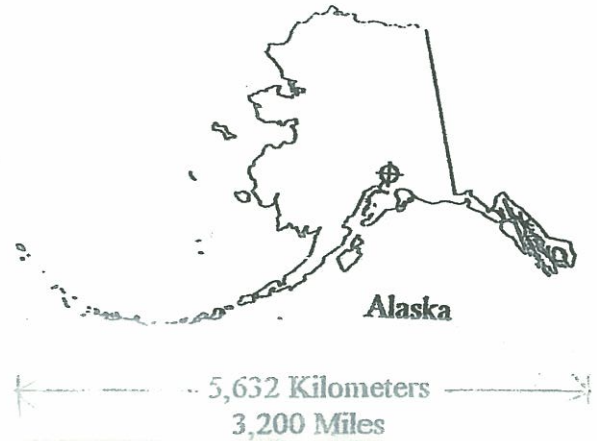
Our firm was selected by the U.S. Army Corps of Engineers, Portland Oregon District to provide engineering design to renovate the aged Bonneville Dam hydro-electric 2 miles long (3.52 kilometers) long dam at Columbia River, Oregon. The design included structural, electrical, mechanical, telemetry and control of the dam's infrastructure, flood gates, spill gates hoist and controls. LSCC further developed the contract plans and specifications for procuring and installing four (4) additional automated gate hoist structures, complete with operating machinery, controls, and their appurtenant equipment to provide a complete operating system. The power and control design was developed to be compatible with the existing gate hoist automation equipment, which provided a complete 16 gate hoist control system. LSCC received a commendation letter from the U.S. Army Corps of Engineers.

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Construction Inspection and Management

**Cable TV Network Installation**

Construction Cost: US \$40,000,000.00

Project Location: Anchorage, Alaska



Our firm provided the construction inspection services for the installation of TV cable for the city of Anchorage. We inspected over 15,000 power poles to which the cable for the TV was attached, and we reviewed the design and inspection of over 40 miles of TV cable, boosters and 15,000 poles for the entire city of Anchorage.

- Interpreted specifications and contract drawings.
- Inspected construction projects. (Includes mechanical and electrical.)
- Resolved construction problems, claims.
- Drafted as-built drawings.
- Submittals and Shop Drawing Review and Approval.

Our resident engineers' duties included update of CPM schedules of the entire construction project, review of construction documents and cost estimates, inspection for conformance with contract requirements, review of contractor's schedules and progress, maintenance of project files, inspection records, testing records, and job diaries; recommending, estimating, and evaluation of change orders, monitoring submittals and costs, review of contractor's payment request; analysis and recommendations related to these services; and other services required for successful administration of the project.

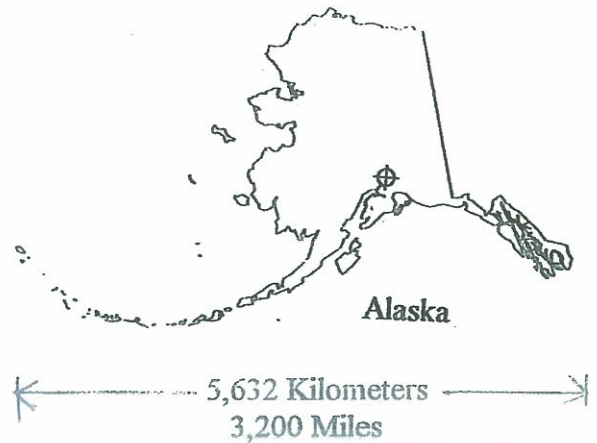
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Mechanical, Electrical, & Civil Contractors  
Construction Inspection and Management

**5<sup>th</sup> Avenue Office Building**

Construction Cost: US \$8,000,000.00

Project Location: Anchorage, Alaska



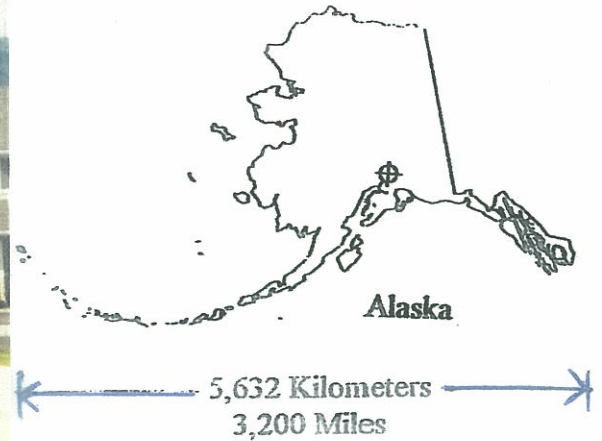
This is one of the most beautiful office buildings in Alaska. It is 8 stories with an octagan shape. All the office spaces have an outside view of Anchorage, from overlooking the Cook Inlet to the Chugach snow-covered mountains.

The building was designed for earthquake zone 5, the most severe earthquake requirement. It sits on the 1964 Good Friday earthquake fault line of Richter Scale of 8.4 and reinforced floor technology. It cost less than \$100 pr square foot on this 88,000 sf building compared to \$200 er square foot with conventional steel structure design. The building received several design excellence awards, including from the American Institute of Architects (AIA), American Society of heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) for energy conservation awards.

***Little Susitna Construction Company, Inc. (Est. 1980)***  
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Construction Inspection and Management

**Alaska Housing Finance Corporation (AHFC)**  
Construction Cost: US \$20,000,000.00

Project Location: Throughout Alaska



LSCC provided architectural and engineering design and construction management services for Alaska Housing Finance corporation (AHFC) for housing located at Anchorage, Kodiak, Bethel, Fairbanks, Valdez, Ketchikan, Sitka, and Kenai, Alaska for a total of 500 units over a 20 year span.

- 12 Units, Kodiak Pacific Terrace Apartments - Kodiak, AK.
- Bethel Heights - 87 Units Mechanical Upgrade - Bethel, AK.
- Sitka - Twenty-Eight (28) 3-Bedroom Family Housing - Sitka, AK.
- Spruce Park Low Income Housing - 200 Unit Upgrade - Fairbanks, AK.
- Review New Senior Citizen Housing Project - 80 Units - Fairbanks, AK.
- Golden Ages Housing Project Upgrade - Fairbanks, AK.
- Seward Senior Citizen Housing Upgrade - Seward, AK.
- 52 Unit Apartment (Engineering Design) - Anchorage, AK.
- Eight (8) 4-Plex Low Rent Housing Upgrade - Anchorage, AK.
- 50 Unit Linda Arm Housing - Anchorage, AK.
- Replace Roofing for 16 Unit Apartment - Anchorage, AK.

Our resident, on-site construction manager's duties included updating of CPM schedules of the entire construction project, review of construction documents and cost estimates, inspection for conformance with contract requirements, review of contractor's schedules and programs, maintenance of project files, inspection records, testing records, and job diaries; recommending, estimating, and evaluating change orders, monitoring submittals and costs, review of contractor's payment request; analysis and recommendations related to these services; and other services required for successful administration of the project.

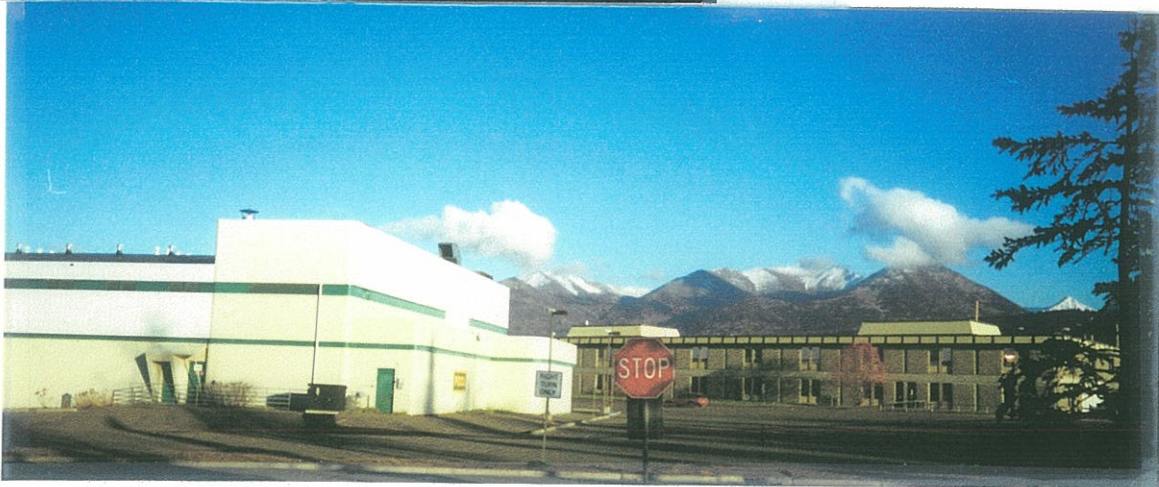
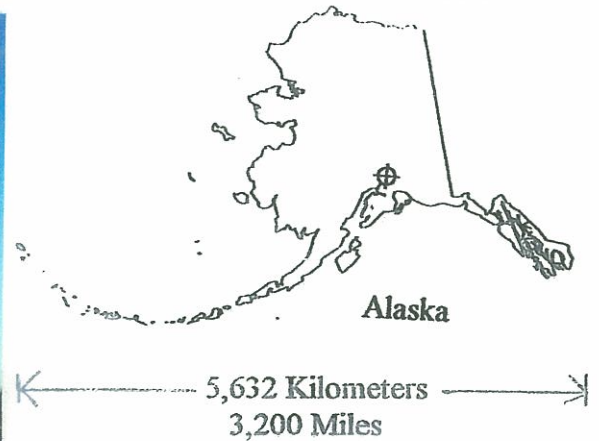
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Mechanical, Electrical, & Civil Contractors  
Construction Inspection and Management

**Robert Service High School Swimming Pool**

Construction Cost: US \$3,500,000.00

Project Location: Anchorage, Alaska

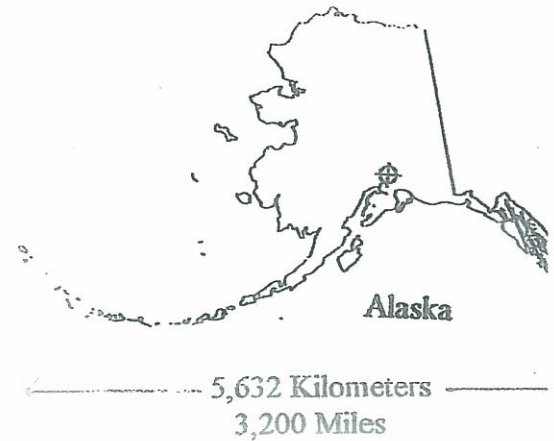


This beautiful swimming pool for the Anchorage School District Robert Service High School, which serves 2,000 students and the South Anchorage community was the first swimming pool in Alaska using continuous pour concrete technology which has a lower cost than traditional aluminum pools and has three times the useful life time. LSCC was the prime constant on this project. LSCC's staff has designed over ten swimming pools in Alaska, and was commissioned by the Anchorage School District as their swimming pool consultant for field surveys, investigations, and providing solutions and construction inspection for four other Anchorage High School swimming pool replacement projects.

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Construction Inspection and Management

**Girdwood Elementary School and Community Library**  
Construction Cost: US \$4,000,000.00

Project Location: Girdwood, Alaska



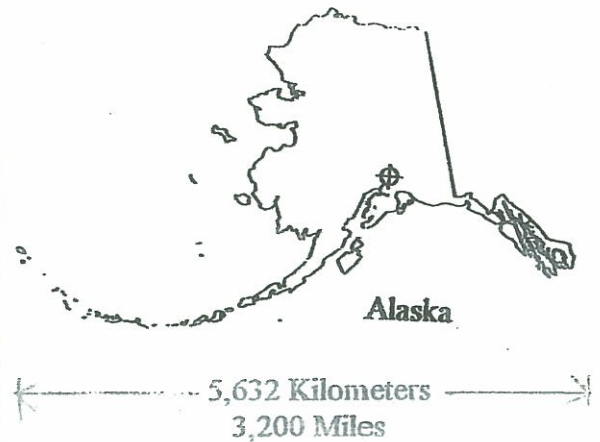
This beautiful Girdwood School and Library for the Anchorage School District, which serves 300 students and the Girdwood community was designed by LSCC's staff.

LSCC's staff also performed construction inspection services. The design of this school also provided some challenges to LSCC's staff. Not did it just have to withstand a 20 foot snow load on the roof, it was built on a previous municipal solid waste dump site. Another challenge was to provide for electrical black outs that occur at Girdwood due to snow avalanches that knock down the electrical power lines. This project won the AIA award and the Municipality of Anchorage Award for Excellence. This school also provided an excellent library for the community of Girdwood.

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**General Construction**  
(General Contractor & Subcontractor)

Project Location: Throughout Alaska



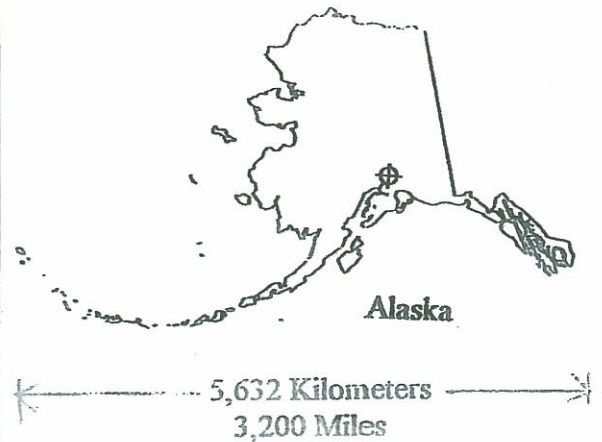
LSCC has been one of the full service general contractors in Alaska since 1980. LSCC did the first job as a subcontractor for Hoffman Construction in the construction of the Anchorage Federal Building and Annex. LSCC has been contracting more than 200 large and small projects, including U.S. Post offices, local government administrative office buildings, schools, senior housing, public housing, swimming pools, highways, sewage lift stations, parking lots, commercial buildings, restaurants, warehouses and churches. LSCC has a complete staff of architects, mechanical, electrical, civil and structural engineers in-house to provide our clients a design/built turn-key construction project which can save the owner substantial amounts of money and time. We have licenses throughout the West Coast.

***Little Susitna Construction Company, Inc. (Est. 1980)***  
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Construction Inspection and Management

## **Mechanical Construction**



Project Location: Throughout Alaska

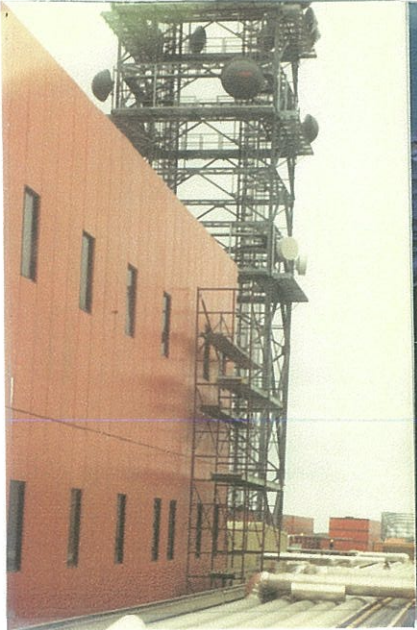
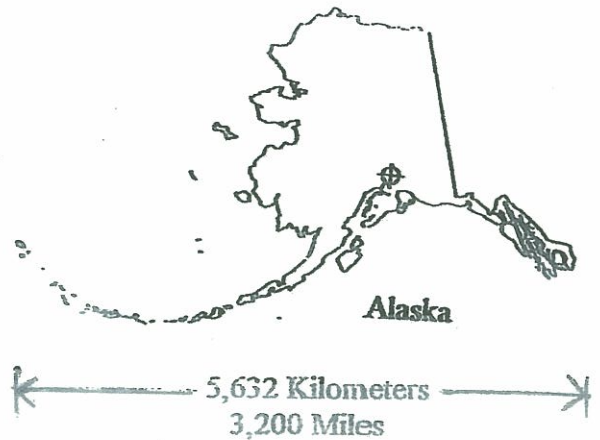


LSCC has licensed mechanical engineers and an mechanical administrator in house to provide our clients a design/build turn-key mechanical project. LSCC has over 22 years of experience with design/build projects which include all kinds of mechanical engineering systems which include plumbing, heating, refrigeration, air conditioning, temperature control for buildings, and other industrial mechanical applications such as swimming pools, water treatment plats, sewage treatment plants, sewage lift stations, steam boiler plants, and refrigeration warehouses.

***Little Susitna Construction Company, Inc. (Est. 1980)***  
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Mechanical, Electrical, & Civil Contractors  
Construction Inspection and Management

## **Electrical Construction**

Project Location: Throughout Alaska



LSCC has licensed electrical engineers and electrical administrators to provide our client's a design/build turn-key electrical project. LSCC has over 22 years of experience with design/build projects which include all kinds of electrical engineering projects such as power generation plants, power distribution systems, power and light for different kinds of buildings, street lighting, cable television, radio and TV broadcast, airport runway lighting, security and monitoring, control systems, information technology, telephone and communication systems, fire alarm and security systems of any type facilities.

## Resume

**Firm Name:** Little Susitna Construction Co.

**Title:** President, Program Manager  
Electrical & Mechanical Engineer

**Name:** Dominic S.F. Lee, P.E.

**Years Employed by firm:** 28

**Total professional experience:** 39 years

### **Education(College, Degree, Year):**

B.S. & M.S. Electrical Engineering, University of Missouri, 1968

M.S. Aerospace Engineering, University of Missouri, 1976

M.S. Mechanical Engineering, University of Missouri, 1976

Graduate Study, Civil Engineering/Environmental Engr., Univ. of AK Anchorage, 1977-1981

### **PROFESSIONAL REGISTRATION AND LICENSES: (Year First Registered/Discipline):**

1974/Mechanical Engineer, WA, AK, TX, MO, OR, HI, AL, LA, MS, GA

1974 Electrical Engineer, WA, AK, TX, MO, CA, OR, HI, AL, LA, MS, GA

General Contractors License, with residential contractor endorsement, AK AA8966

Architects Engineering License, AK A-584

Mechanical Administrator, AK AA213: HCPP UHVCS RHVC UR CNTL RPHH UC.

Electrical Administrator License, AK 1155 with endorsement: UL

### **Awards, Publications:**

Who's Who in America; Who's Who in the West; Young Engineer of the Year, Missouri Society of Professional Engineers; Honor Knight of St. Patrick (Patron Saint of Engineers); College of Engineering, University of Missouri; Mayor's Award of Excellence, City of Anchorage, Alaska.

### **Brief Summary of Relevant Experience:**

Mr. Lee has 39 years of engineering experience in the field of mechanical and electrical engineering. As a Mechanical Engineer, Mr. Lee is qualified to design Heating and Ventilation and Air Conditioning systems, Plumbing and Fire Protection systems, temperature control and energy management of facilities. As an Electrical Engineer, Mr. Lee is qualified to design power and lighting of buildings, power generation, transmission and distribution, telecommunications and radar, FAA air traffic facilities. As a construction manager/inspector, he makes sure that all construction is built according to the A/E design and current applicable codes. Examples of relevant experience are listed below:

- Construction Mgmt/Inspection - U.S. Coast Guard Nationwide, CIP Projects including AK, HI.
- Engineering Design and Construction Inspection, Anchorage Marriott Hotel. \$88 million
- Mentasta Medical & Dental Clinic, Community Freezer Building, Mentasta, Alaska.
- 21 2-3 Bedroom HUD Units for Northwest Inupiat Housing Buckland, Deering & Kavalina, AK.
- Cook Inlet Housing Robert Rude Senior Housing Complex, Electrical & Fire Alarm Design, Anch., AK.
- AHFC, Park View Manor Mechanical and Electrical Design, including fire alarm system design, Alaska.
- Kenai & Ninilchik Senior Housing Complexes, Mechanical & Electrical Upgrade, AK.
- ARCO Prudhoe Bay Main Camp Mechanical & Electrical Upgrade, AK.
- ARCO Kuparuk Oil Field Development (10 years), AK.
- ARCO Prudhoe Bay Oil Field Engineering and Inspection Services, North Slope, AK.
- ARCO Kuparuk Communication Building and Tower, AK.
- Federal Building PCB & Lead Paint Removal, Juneau, AK.
- Elim, Pt. Lay, Petersburg, Kotzebue & Barrow Airport Lighting construction, AK.

## **Resume**

**Firm Name:** Little Susitna Construction Co., Inc. **Title:** Senior Architect

**Name:** William L. Kim, Architect

**Years Employed With Firm:** 26

**Total Professional Experience:** 37 years

**Education(College, Degree, Year):**

B.S. Architecture, University of Idaho, Major in Architectural Design, 1959

**Professional Registration and Licenses:**

Year First Registered/Discipline: Architect 3765, Alaska, 1974 NCARB

**Previous Employment:**

- U.S. Army, Ft. Richardson, AK
- McEntire & Pendergrast Architects, Anchorage, AK
- Alaska State Housing Authority, Anchorage, AK
- Parker and Garrison Architects, Tacoma, WA
- Leo A. Daly, Architects, Seattle, WA

**Brief Summary of Relevant Experience:**

Mr. Kim has 47 years of experience as an Architect, 29 of which were in Alaska. Mr. Kim is familiar with the unique design criteria required for construction in Arctic and sub-Arctic regions. Recent projects were located in Prudhoe Bay, Kotzebue, Bethel, Barrow, Anchorage, Juneau, and Fairbanks. He is also experienced in the design of commercial and public facilities in urban areas of Alaska. He maintains a thorough understanding of codes, laws, regulations and permits as they relate to design.

**Recent projects include:**

- State of Alaska Dept. of Public Safety, 1500 KW Emergency Power Plant, Anchorage, AK.
- AHFC, Sitka Paxton Manor, 24 units of housing, new roof, siding and window retrofit.
- Gallo's Mexican Restaurant - Anchorage and Fairbanks, AK.
- ARCO Prudhoe Bay Oil Field Medical & Dental Bldg., AK.
- ARCO Kuparuk Oil Field Communication Bldg. & Tower, AK.
- Bob Reeves Jr./Sr. High School - Adak, AK.
- Scammon Bay School, Lower Yukon School District, AK.
- Four Anchorage School District Swimming Pools Design Review - Anchorage, AK.
- University of Alaska, Arctic Animal Research Center - Fairbanks, AK.
- Mentasta Medical and Dental Clinic, Community Freezer - Mentasta, AK.
- Kenai Senior Housing Complex and Ninilchik Senior Complex, AK.
- U.S. Fish and Wildlife Headquarters - Bethel, AK.
- BIA Housing Authority, 45-unit 3 bedroom homes - Sitka, AK.
- HUD funded 50 Units 3-Bedroom Single Family Housing - Sand Point, Valdez, Deering, Buckland, AK.
- 64 Family Officer Housing, Houston Housing Subdivision, Elmendorf AFB, AK.
- 124 Family Enlisted Men's Housing, Phoenix Housing Subdivision, Elmendorf AFB, AK.

## Resume

**Firm Name:** Zachary Bryans Story, AIA

**Title:** Architect

**Years Employed by firm:** 0

**Total Professional  
Experience:** 6 years

**Education(College, Degree, Year):**

Master of Architecture, Tulane University School of Architecture, 1999.

**Professional Registration and Licenses:**

Year First Registered/Discipline: 2004, Architect, State of Georgia

**Awards, Publications:**

None

**Previous Employment:**

- Story Residential Design - Atlanta, GA
- Gardner Spencer Smith Tench & Jarbeau (Architects) - Atlanta, GA

**Brief Summary of Relevant Experience:**

- Principle Architect - Residential and small commercial design.
- Project Architect - Educational/Performing Arts
  - Responsible for all states of design and project development from pre-design to construction documents; scheduling and project progression; governmental reviews and permitting procedures; primary client contact; meeting coordinator; project team leader and coordinator.
- Project Manager - Commercial Banking
  - Responsible for all stages of design and project development from pre-design to construction documents; governmental reviews and permitting procedures, construction administration.
- Assistant Project Manager - Educational
  - Responsible for design development; construction document production; construction administration.
- Assistant Project Manager - Office Building
  - Responsible for design development, code analysis, construction document production.

## **Resume**

**Firm Name:** Little Susitna Construction Co., Inc. **Title:** Chief Electrical Engineer

**Name:** Robert E. Lovdahl, P.E.

**Years Employed With Firm:** 14

**Total Professional Experience:** 46 years

### **Education(College, Degree, Year):**

B.S. Electrical Engineering, University of Minnesota, 1949

### **Professional Registration:**

Year First Registered/Discipline: Electrical Engineering - MN, ND, OH, AK, 1954

### **Previous Employment:**

Mr. Lovdahl has been a Professional Engineer since 1954 and has been working in Alaska since 1973. His project responsibilities consist of lighting design and layout, power distribution systems design and layout, and the writing of electrical specifications. Mr. Lovdahl was an Electrical Engineer with the Federal Cartridge Corp., Twin Cities Arsenal, New Brighton, Minnesota; a Chief Electrical Engineer for Ellerbe-Alaska and Senior Electrical Engineer for Ellerbe Association of Bloomington, Minn. for 27 years. His work consisted of lighting design and layout, power distribution system design and layout and fixture and electrical equipment specifications for new industrial commercial and institutional buildings and/or under reactivation and remodeling.

### **Brief Summary of Relevant Experience:**

His knowledge and experience is extensive, as are the projects he has engineered.

- Service High School Swimming Pool, Anchorage, AK
- ARCO Prudhoe Bay Oil Field Recreational Blvd., North Slope, AK
- Girdwood Elementary School, Girdwood, AK
- Univ. of AK., Patty Gym, Juneau, AK
- Valdez High School, Energy Conservation, Valdez, AK
- ARCO Prudhoe Bay Oil Field Medical & Dental Bldg., AK
- Chevak School Addition, Chevak, AK
- ARCO Prudhoe Bay Oil Field Communication Bldg. & Tower, AK
- Bob Reeves Jr./Sr. High School, Adak, AK
- Scammon Bay School, Lower Yukon School District, AK
- Seward High School, Seward, AK
- Four Anchorage School District Swimming Pools Structural Review, Anchorage, AK
- Univ. of AK, Arctic Animal Research Center, Fairbanks, AK
- Kenai Community College Addition, Kenai, AK
- ARCO Prudhoe Bay Office Building, AK
- Muldoon Christian School, Anchorage, AK
- ARCO Prudhoe Bay Four Large Warehouse Repairs, AK
- Jesse Lee Home and School, Anchorage, AK
- ARCO Prudhoe Bay Fire Truck and Warehouse Bldg., AK
- Bering Straits School District 7 Villages, AK
- UAA/ACC Ventilation System, Anchorage, AK
- University of Alaska Fairbanks Five Student Dormitory Electrical Design, including fire alarm, AK.

## Resume

**Firm Name:** Little Susitna Construction Co., Inc. **Title:** Architect/Project Manager,  
Construction Inspector

**Name:** Dennis J. Parker, AIA

**Years Employed With Firm:** 5

**Total Professional Experience:** 32 years

### Professional Registration and Licenses:

Architectural Registration: Oregon #3080

### Previous Employment:

- Mirus Corporation - Eugene, Oregon

### Brief Summary of Relevant Experience:

1993 to 1998

U.S. Coast Guard Governor's Island Relocation ● New York	Project Manager
U.S. Coast Guard Housing Project ● Honolulu (.3m)	Contracting Officer's Representative

1988 to 1993 - Oregon

Sacred Heart Medical Records Remodel ● Eugene (.5m)	Architect's Representative
Sacred Heart Cancer Care Center Remodel ● Eugene (.5m)	Architect's Representative
Sacred Heart Medical Office Building Shell ● Eugene (5m)	Architect's Representative
International Paper Corp Office Building ● Veneta (.5m)	Architect's Representative
Harvard Medical Park Surgicenter ● Roseburg (4m)	Construction Engineer
US Bancorp Operations Center ● Gresham (20m)	Construction Engineer
Rouge Valley Medical Center ● Medford (25m)	Quality Control Manager

1982 to 1988 - Alaska

Renkert Residence ● Anchorage (.5m)	Designer
Cimmaron Circle Townhomes ● Anchorage (7m)	Designer/Builder
Spicewood Condominium ● Anchorage (8m)	Designer/Builder
The Greenhouses of Foxhall ● Anchorage (3.5m)	Designer/Builder
Brittany Place Townhomes ● Anchorage (4m)	Designer/Builder

1975 to 1982 - Oregon & California

Performing Arts Center ● Eugene (32m)	Construction Engineer
Various Residential Projects ● San Jose (16m)	Construction Superintendent

1972 to 1975 - Alaska

Westbluff Condominium ● Anchorage (4m)	Designer
Lakewood Terrace Townhomes ● Anchorage (9m)	Designer
Dr. Pauli Residence (.2m), Dr. Day Residence (.25m) ● Anchorage	Designer/Builder
The Park Cluster Homes ● Anchorage (1.25m)	Designer/Builder

1966 to 1972 - California

Shasta Junior College ● Redding (18m)	Construction Engineer
Belmont Plaza Beach Center ● Long Beach (3m)	Construction Engineer
Various Projects to Woodward/Nichols Architects ● Redding (25m)	Draftsman
Bridge Bay Resort Improvements ● Lake Shasta (1m)	Construction Manager

## Resume

**Firm Name:** Little Susitna Construction Co.      **Title:** Senior Electrical Engineer  
Telecommunications Engineer

**Name:** Whitham D. Reeve, P.E.

**Years Employed by firm:** 12 Years      **Total professional experience:** 25

**Education(College, Degree, Year):**

B.S. Electrical Engineering, University of Alaska (Cum Laude), 1969

**Professional Registration (Year First Registered/Discipline):**

Electrical Engineering, AK, WA, Yukon, Canada, 1976

**Awards, Publications:**

None

**Previous Employment:**

- Reeve Aleutian Airlines, Anchorage, AK
- Anchorage Telephone Utilities, Anchorage, AK
- Fairbanks Telephone Utility, Fairbanks, AK

**Brief Summary of Relevant Experience:**

Mr. Reeve has been a professional engineer since 1976. He is highly experienced in design of telecommunication and power systems for Alaskan cities and villages. Areas of specialization include radio engineering (FCC First Class License); electric power systems engineering (including generation, transmission, distribution, and primary and secondary metering); utility rate studies and rates design; and utility administration.

**Experience includes the following projects:**

- Design of telemetric controls for Anchorage Water Utility and Anchorage Sewer Utility.
- Fairbanks Municipal Utilities Systems switching equipment.
- GCI design of interface between Satellite and Company Equipment.
- Design of complete utility systems in King Cove, Nushagak, Akutan, and Pelican.
- Airport Navigation Systems in Soldotna and White Mountain.
- Telephone System for the city of Cordova, AK.
- Telephone System for the city of Kotzebue, AK.
- Telephone System for the city of Dillingham, AK.
- Anchorage East Wire Center, AK.
- 36 State Owned Airports Electrical Power Plant, AK.
- 40 State Owned Airport Nav-Aid, Becon-Unicom, Tranc/Recv., AK.
- 3 State Owned Airports Runway Lighting Design, AK.
- Anchorage Citywide Cable T.V. Installation (400 miles) AK.
- Anchorage Power and Light 15,000 Power Poles Inspection, AK.
- Independence Park Primary Electrical Power, Anchorage, AK.
- Girdwood Telephone Wire Center, Emergency Power Plant, AK.
- Channel 7 T.V. Station, Studio and 800 ft. Tower, Anchorage, AK.
- Alaska Public Broadcast 4 radio stations, 1 TV station, 13 Ground Stations, and over 20 Microwave stations and Trans-receiver stations, various locations in the state.

## **Resume**

**Firm Name:** Little Susitna Construction Co., Inc. **Title:** Construction/Project Manager  
Foreman / Quality Control technician  
Mechanical & Electrical Inspector

**Name:** John H. Waalkes

**Years Employed With Firm:** 15

**Total Professional Experience:** 42 years

**Education(College, Degree, Year):**

Mechanical

**Professional Registration (Year First Registered/Discipline):**

Mechanical Administrator AA 305 Alaska  
Electrician No. 110035 Alaska

**Previous Employment:**

- KSK Enterprises - Full Service Mechanical & Plumbing Contractor, AK.
- Pribilof Island Processors - Fish/Crab Processing Plants, pribilof Islands, AK
- I.C.B.O. Combination Inspector #55509
- Alaska Housing Combination Inspector #105

**Brief Summary of Relevant Experience:**

- Juneau Federal Building PCB Remediation & Temporary heating, Juneau, AK.
- Mechanical and Electrical Construction Inspection Experience
- State of Alaska Dept. of Buildings - Arctic Construction
- Public Safety Building - Kotzebue and Various Villages in Alaska
- HUD/FHA - Statewide Construction Inspection
- Geophysical Services, Inc. - Arctic Exploration, Remote Seismic Crews
- Construction inspection, Loran Transmitter Building at St. Paul Island, AK.
- Construction inspection, Loran Transmitter Building & Power Plant, Port Clarence, AK.
- USCG Pier Upgrade - Charleston, SC.
- USCG Family Housing Project, Barbers Point, HI.
- USCG Family Housing Project, Petersburg, AK.
- Port Heiden DOT & PF Airport Equipment Buidling, AK.
- Point Lion School Painting and Roofing, Kodiak, AK.
- Kenai Senior Housing Complex Electrical Upgrade, Kenai, AK.
- Ninilchik Senior Housing Complex Electrical Upgrade, AK.
- Eight Elementary School Fire alarm System Installation, Anchorage, AK.
- BIHA Sitka Housing (45 units) electrical Design, including fire alarm, Sitka, AK.

## **Resume**

**Firm Name:** Little Susitna Construction Co., Inc. **Title:** Construction Manager/Inspector  
Environmental Engineer  
**Name:** Frank Madison Compliance Officer

**Years Employed With Firm:** 8

**Total Professional Experience:** 30 years

**Education(College, Degree, Year):**

B.S., Engineering, University of WA, 1963

Continuing Education: Chemistry, Environmental Engineering

**Previous Employment:**

Mr. Madison's background encompasses approximately 10 years as an educator and the last 20 years in various aspects of environmental engineering and cleanup.

From 1993 to 2002, Mr. Madison served as Little Susitna Construction Company's (LSCC) Chief Environmental Officer responsible for projects under LSCC's contract with the U.S. Coast Guard in support of their environmental cleanup activities at the Kodiak Support Center and other U.S.C.G. locations on Kodiak Island. Some of these projects have included bulk fuel tank farm cleanup activities, tank decommissioning, and biocell remediation. The scope of his duties remained essentially the same as listed below except now in a civilian capacity.

From 1988 to 1994 Mr. Madison served as the Chief Environmental Specialist for the U.S. Coast Guard in Alaska. Ensured all shore units and ship stations in District 17 as well as the Kodiak Support Center were in compliance with all Environmental laws and regulations. During the course of this position, Mr. Madison has: prepared SPCC plans and emergency responses for hazardous waste incidents; supervised hazardous waste management, including on site classification and hands-on cleanup of hazardous wastes and fuel spills; written environmental documents and NEPA compliance; addressed environmental health concerns as far as pollution abatement and the monitoring of shore facilities to assure safe operations; prepared hazardous waste and pollution clean up contracts having to do with a variety of contaminants from TSCA regulated to RCRA regulated; trained personnel in hazardous waste management, classification and disposal; prepared annual hazardous waste disposal contract specifications and monitored same; prepared hazardous and toxic waste minimization plans; performed hazards waste classification and removal from remote sites requiring up to Level A Suite-up; identified safety and OSHA violations in the field of hazardous waste; assisted shore units in hazardous waste plan formation and management; and prepared EC&R budgets and projects.

Mr. Madison spent a period of four years as the Head of the Environmental Quality Section at Grand Coulee Dam, the largest electrical producing hydroelectric plant in the world. In that position he assured environmental compliance in the operation and maintenance of transmission right of ways and irrigation canals, coordinated with various Fish & Wildlife agencies over pollution control and impact to wildlife and developed plans to mitigate loss of habitat due to construction and operation of the dam and reservoir.

**Brief Summary of Other Environmental Experience:**

Mr. Madison has been instrumental in developing environmental programs to assist federal agencies in compliance with Federal, State, and local laws as well as those associated with Indian tribes and reservations. He has initiated several projects to alleviate community concerns over installation of new transmission lines, PCB disposal and reservoir fluctuation. He also developed fish and wildlife programs regarding both endangered species and possible stream degradation by reclamation pumping operations in Washington.

## **Resume**

**Firm Name:** Little Susitna Construction Co., Inc. **Title:** Electrical Superintendent/Foreman  
Journeyman Electrician (IBEW)

**Name:** Sixta A. Barrera

**Years Employed By Firm:** 6

**Total Professional Experience:** 49 years

### **Education:**

DeForest Training, Inc. (now DeVry Inc.) 3 years Basic Electricity through Industrial Electronics.

U.S. Navy Electrical School

Continuing Ed: Various college courses in math, computer science, accounting, and management.

### **Professional Registration and Licenses:**

Year First Registered/Discipline: Electrician No. 110466 Alaska

### **Awards, Publications:**

Outstanding Civilian Technician of the Quarter 1990

Superior Outstanding Award 1989

Civilian of the Quarter July-Sept 1987

### **Previous Employment:**

- Journeyman Electrician - Alcan Electrical Contractors
- Journeyman Electrician - Udelhoven Oilfield System Services
- Journeyman Electrician - Quality Electric
- Journeyman Electrician - Arctic Camps & Equipment
- Electrical Foreman - Independent Electric
- Field Manager- Fuchs Electric
- Electrical Equipment Repairer - US Air Force
- Electronic Technician - Federal aviation Administration

### **Brief Summary of Relevant Experience:**

- Electrical Construction Superintendent/Foreman.
- Electrical installations on commercial, industrial and residential facilities.
- Electrical industrial construction and installation at Prudhoe Bay, Alaska.
- Worked explosion-proof installations around oil well operations as well as at paper mills, pulp mills and service stations.
- Electrical Equipment Repairer at power production facilities at remote sites throughout AK.
- Electrical construction at waste oil/water separators, elevators, water wells and sewer plants.
- Electrical installations at Mat-Valley Federal Credit Union, water-treatment plant in Silverton, Oregon, several service stations and numerous residential multi-units.
- Electrical Construction USCG Shore Ties Upgrade - ISC Kodiak, Alaska.
- Electrical Installation of Demand Lighting Technology (DeLiTe) System and Parking Lot Lighting Upgrade at Alaska Army National Guard, Ft. Richardson, AK.
- Electrical Installation in support of Energy Recovery Unit System at Alaska Army National Guard, Ft. Richardson, AK.
- Electrical installation of airport runway lighting upgrade systems at Barrow and Kotzebue, AK.

## **Resume**

**Firm Name:** Little Susitna Construction Co., Inc. **Title:** Civil/Structural Engineer  
Construction Manager/Inspector

**Name:** R. Scott Bonney, P.E.

**Years Employed With Firm:** 6

**Total Professional Experience:** 25 Years

**Education(College, Degree, Year):**

B.S. Civil Engineering, University of Washington, 1978

**Professional Registration:**

Year First Registered/Discipline: Civil Engineering Alaska, 1982 CE 6506

**Awards, Publications:**

None

**Previous Employment:**

- Bonney & Bonney Construction Management Services, Kodiak, AK
- Coffman Engineers, Inc., Anchorage, AK

**Brief Summary of Relevant Experience:**

Scott Bonney has over twenty years of construction management, inspection and engineering experience throughout Alaska. He has been responsible for construction management of schools, communications facilities, housing projects, a medical facility and civil projects including an arctic sewage system, a steel bridge and a fuel storage facility.

- USCG Construction Management/Inspection Nationwide, CIP Projects including AK & HI.
- Aviation Hill Family Housing, Phase III, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Housing Phases 8, 9, 10, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Fuel Farm & Tank N61, Kodiak, AK, U.S. Coast Guard, FD&CC.
- COMMSTA Renovation, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Senior Officers Quarters, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Health Care Facility, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Ready Crew Facility, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Hangar 1 Energy Retrofit, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Family Support Facility, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Cold Weather Training Facility, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Swimming Pool Addition, Phase I, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Fire Station, Kodiak, AK, U.S. Coast Guard, FD&CC.
- Wendler Jr. High Addition, Anchorage, AK, Anchorage School District
- Anaktuvak Sewage System, Anaktuvak Pass, AK, North Slope Borough
- Contact Creek Bridge, Anaktuvak Pass, AK, North Slope Borough
- Allstate/Stewart Office Building, Anchorage, Stewart Construction Company

## Resume

Firm Name: Little Susitna Construction Co., Inc. **Title:** Project Superintendent,  
Construction Manager

**Name:** Andrei M. Buckareff

**Years Employed By Firm:** 20

**Total Professional Experience:** 38 years

**Education(College, Degree, Year):**

Pacific Latin American College - La Puente, CA / B.S. / 1965

**Professional Registration and Licenses:**

None

**Previous Employment:**

- Self-Employed

**Brief Summary of Relevant Experience:**

- Mr. Buckareff's background encompasses 38 years in General Construction/Arctic Construction Industries. He has extremely well grounded experience in the civil and mechanical fields. Mr. Buckareff has a strong background in construction management, inspection, materials take-off, man-hour estimating, contract negotiation and administration. This experience, coupled with a multi-disciplined field experience, gives him a strong sense of direction in laying-out, scheduling and prosecuting a project.
- Mr. Buckareff is a Russian-American, and **speaks fluently in Russian, Spanish and English.** He was responsible for Aleutian Housing Authority's Single Family Housing project construction management at Sand Point, Alaska and 45 unit Single Family Housing Project construction management at Sitka, Alaska. Mr. Buckareff also built and remodeled U.S. Post Offices for Little Susitna Construction company for over ten years, to include post offices at Healy, Savoonga, Minto, Kavalina, Nome, Bethel, Juneau, Anchorage, Delta Junction, Hydaburg, Kake, Douglas, Kotzebue, Barrow, Palmer, Sitka, Wrangell, Kodiak, Ouzinkie, Homer, Valdez, Fairbanks, and Tok, Alaska.
- Mr. Buckareff's duties, as an on-site construction manager, included updating of CPM schedules of the entire construction project, review of construction documents and cost estimates, inspection for conformance with contract requirements, review of contractor's schedules and programs, maintenance of project files, inspection records, testing records, and job diaries; recommending, estimating, and evaluating change orders, monitoring submittals and costs, review of contractor's payment request; analysis and recommendations related to change orders.

## **Resume**

**Firm Name:** Little Susitna Construction Co., Inc. **Title:** Civil Engineer

**Name:** Sandor Manyoky, P.E.

**Years Employed With Firm:** 2

**Total Professional Experience:** 25 Years

**Education(College, Degree, Year):**

B.S. Civil Engineering, Mississippi State University, 1981

**Professional Registration:**

Year First Registered/Discipline: Civil Engineering Alaska, 1982 CE 8467  
Civil Engineering Mississippi, 1981 CE 10790

**Awards, Publications:**

None

**Previous Employment:**

- Tryck, Nyman & Hayes, Inc., Anchorage, AK
- Datum Engineering & Surveying, Inc., Anchorage, AK.
- Pacific Management & Engineering, Inc., Anchorage, AK.
- Modjeski & Masters Consulting Engineers, New Orleans, LA

**Brief Summary of Relevant Experience:**

Sandor Manyoky has over twenty-five years of engineering design and construction management throughout Alaska. Since 1985 Mr. Manyoky has focused on construction services emphasizing soil, concrete and asphalt testing, gradually adding pile load testing and construction surveying. Following is a summary of projects over the last five years.

- King Salmon Lake Camp Road - Design Engineering, Quality Control, Soils Testing.
- Alaska Railroad Fairbanks Intermodal Facility - Surveying and Environmental Engineering.
- Eek Airport Runway - Surveying and Materials Testing.
- Iliamna Clinic - Surveying, Soils and Concrete Testing.
- Fort Wainwright Mission Support Training Facility - Pile-Load Testing.
- Bristol Bay Housing Authority 18-Unit Housing - Surveying.
- Tuntutuliak Airport - Surveying and Project Manager.
- Elmendorf Air Freight Terminal - Project Manager/Design Engineer.
- Anchorage School District Nutrition Center - Project Manager/Design Engineer.
- King Salmon Visiting Officers Qtrs., Comm. Center - Project Manager/Design Engineer.
- Bristol Bay Borough School Addition, Naknek Seawall Repair, Fishgrinder Facility, Various Road Design and Erosion Control projects.

## Non-Confidential Summary of Appendix G

Little Susitna Construction Company, Inc. is a privately owned corporation so its financial information is considered proprietary.